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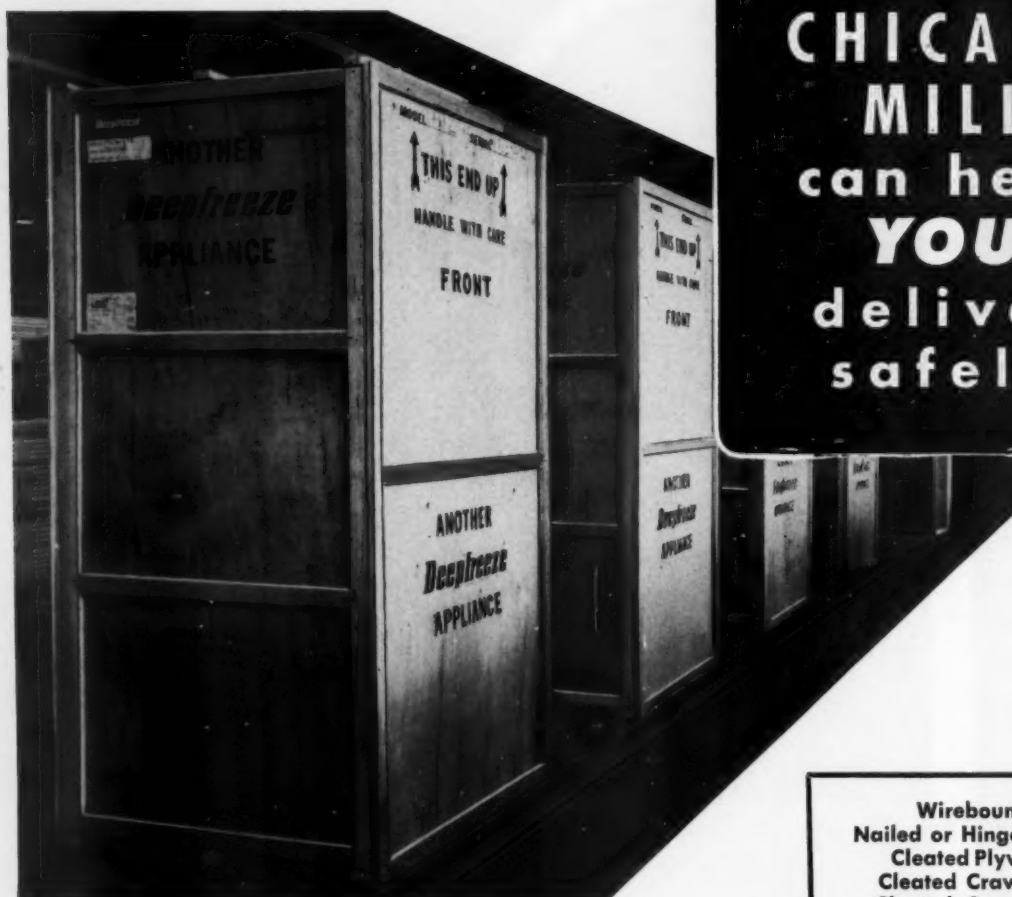
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safe transit

ASSEMBLY LINE TO FINAL CUSTOMER



**CHICAGO
MILL**
can help
YOU
deliver
safely

Deepfreeze and many other leading appliance manufacturers depend upon Chicago Mill and Lumber Company to provide safe shipment for their finished products.

If you are having difficulty in solving a troublesome shipping problem, call in a Chicago Mill representative. Technical information, packing information, and testing services are available without obligation.

Wirebound,
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
Woodsteel Nesting Boxes

★
FOR DOMESTIC OR EXPORT
FOR PEACE OR DEFENSE

**A shipping container for
every shipping purpose**

FOR SAFER TRANSIT BY •  TRUCK •  BOAT •  TRAIN •  PLANE

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street

Chicago 3, Illinois

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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Chicago 1, Illinois
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Lower Shipping Costs PLUS Higher Packing Production



with **cush-on-strap**

Cush-On-Strap is strong as a giant but gentle as a lamb... ideal for protective packing of all types of appliances and other finished metal and wood products.

8 reasons why Sackner's CUSH-ON-STRAP will help you

- 1 ONE PACKAGE**—high grade steel banding for strength; and protective, soft, fluffy cellulose padding, — all in one unit.
- 2 CUTS LABOR COSTS**—one man does the work of two. Standard tools used.
- 3 STEPS UP PACKING PRODUCTION**—lowers your packing costs.
- 4 READY TO USE** the minute it arrives—no delay in measuring and cutting; lengths pre-determined; no waste; metal pre-scored for ease in breaking in lengths required for your product; 6-inch spacings permit quick application with the clinching tool; stripped for 6 inches at both ends of the length; comes to you on a convenient fibre throw-away reel.
- 5 ELIMINATES FUSSY PRE-ASSEMBLY.**
- 6 NO SHIPPING DAMAGE** —eliminates broken catches, hinges, drawer tracks, etc., — preventing costly replacements.
- 7 WILL NOT STAIN OR MAR THE FINEST FINISHES.**
- 8 WIDE RANGE OF USES** —for packing automotive finished parts, dish washers, household furniture, ironers, machinery, metal kitchen units, office equipment, ranges, refrigerators, scales, washing machines, x-ray equipment, etc.

CUSH-ON-STRAP is one result of 37 years experience in converting cellulose paper, jute, cotton and other raw materials into braided, twisted, shaped, laminated and woven products for the furniture, automotive, electrical, packaging and other industries.

USE THE COUPON to learn how we can serve you in the packing and shipping of your products.

SACKNER PRODUCTS
900 Ottawa Ave., N. W.
Grand Rapids, Michigan

How can CUSH-ON-STRAP lower our shipping and packing costs?

☐ Our products are.....

☐ Please have your Packaging Engineer demonstrate the advantages of CUSH-ON-STRAP.

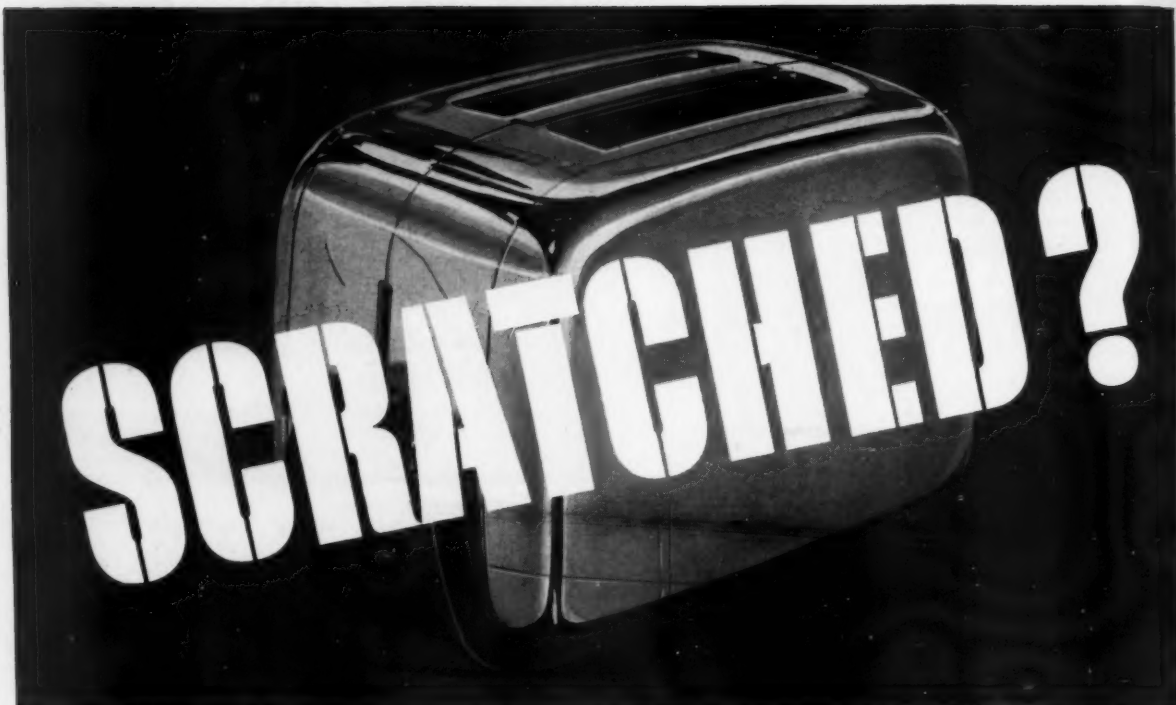
Firm Name

Address

By..... Title.....

Sackner Products

900 Ottawa Avenue, N. W.
GRAND RAPIDS 2, MICHIGAN



Not when you use KIMPAK* 301 !

New KIMPAK 301 is the practical solution to appliance surface scratching and other marring damage. KIMPAK 301's ability to shield the fine finish from abrasive high spots on the inner walls of cartons and blocking and bracing members of crates makes it the ideal protective agent in an appliance package. And KIMPAK 301 costs no more than ordinary materials. It is specially designed to prevent the three major causes of scratching:

1. Abrasiveness of the inner spacers. Kimpak 301 provides a scratch-free, non-disintegrating, compressible barrier between inner spacers and the appliance finish. Its conformability ensures a snug package.

2. Dust, dirt, cinders that sift into the container. The combination of high creping and porous structure—exclusive with KIMPAK—traps dirt, grit or cinders, which may lodge between the packaging material and the surface.

3. Abrasive action of harsh packaging materials. KIMPAK 301 is soft and non-abrasive . . . free from wood splinters, dirt and other abrasive materials. No lumps, hard glue spots or stiff wrinkles.

Scratching is but *one* of many problems encountered in appliance packaging. These problems are solved with KIMPAK 301. For more details, contact the KIMPAK distributor in your area, or mail coupon below.

SPECIFY KIMPAK 301 TO SOLVE THESE INTERIOR PACKAGING PROBLEMS:

Scratching
Pressure-marking
Staining
Corrosion
Conformability
Ease of handling
Appearance
Disintegration

Whatever your protective interior packaging requirements, there is a Kimpak specification that does the job . . . better!



A Product of
Kimberly-Clark

KIMBERLY-CLARK CORPORATION
Neenah, Wisconsin

Dept. F-34

We would like to learn how new Kimpak 301 can provide better protection at lower cost for our products. Please send complete information.

Name.....

Firm Name.....

Street Address.....

City..... Zone..... State.....



"CASE" HISTORIES FROM ATLAS PLYWOOD'S SHIPPING CONTAINER CLINIC (Safe-Transit Certified)

Single new Atlas Plywood case replaces three
old cases . . . provides greater protection in
transit . . . saves multiple handlings and storage
space for manufacturer and distributors

THIS CASE WASTED MONEY

These three packages, received some time ago at the Atlas Plywood Shipping Container Clinic, contained the three parts of a Unitaire Conditioner*. The chassis, covered by a paper envelope, was in the large open crate. The long side panels were in a carton and the front, back and top panels in a fibre-board box. A cross-piece on the crate was broken and one side of the fibre box was punctured.

THIS CASE SAVED MONEY

Atlas Plywood recommended shipping the air conditioner completely assembled in this single plywood case. Cutting down the shipping units from three to one saves many handlings by manufacturer and distributors, and reduces storage space requirements. The new Atlas Plywood case provides ample room for merchandising labels or trade-marking — and the plywood design virtually eliminates transit damage.

PUT YOUR OWN CASES TO THE TEST

Ship samples of your products, in their present containers, to the Atlas Plywood Shipping Container Clinic. We'll give them tests reproducing all conditions of actual transit. You'll get a full report on how they stand up, along with any needed recommendations for improvements in your container design. And you're cordially invited to watch the tests.

This service by Atlas Plywood — *the greatest name in plywood* — is absolutely free and you are in no way obligated to follow our recommendations. Take advantage of it to cut your present shipping costs, including what you pay for containers, for shipping those containers — at the rate for the contents — and for damages.

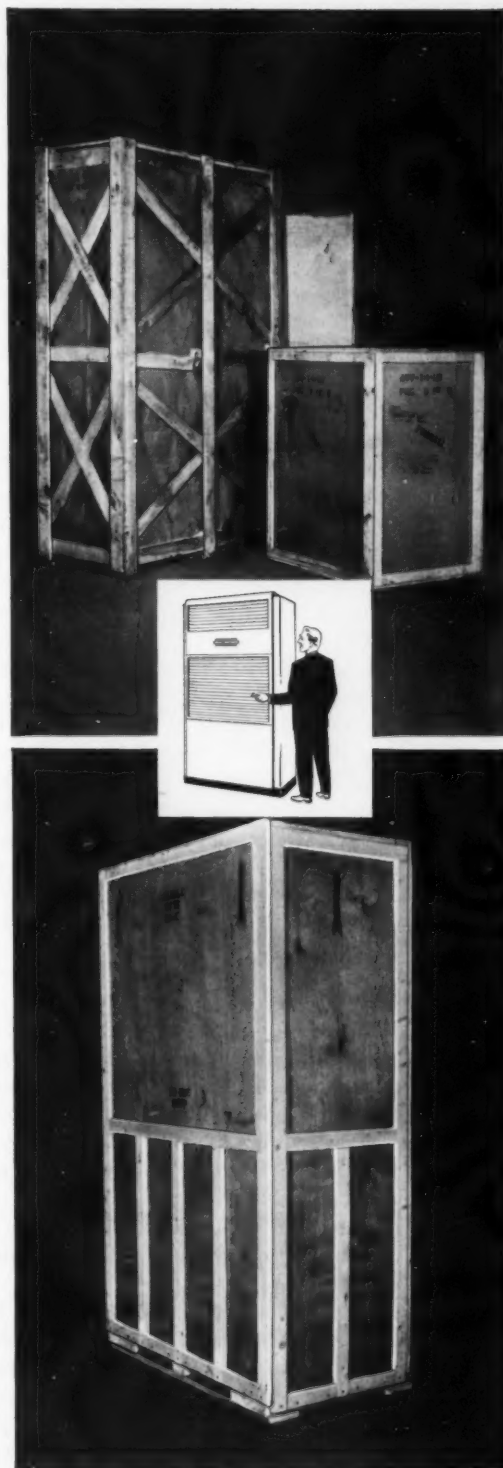
Your Atlas Plywood representative (see Classified Telephone Directory) will be glad to make the arrangements. Or write to Atlas Plywood Corporation, 1432 Statler Building, Boston, Mass.

Atlas Plywood

CORPORATION
FROM FOREST TO FINISHED PRODUCT



PLYWOOD
CONTAINERS
FLUSH DOORS
HARDWOOD PANELS



*Air Conditioner made by
Westinghouse Electric Corp., Hyatt Park, Mass.

The SAFE TRANSIT LABEL

the story of an emblem that pays its own way

THE National Safe Transit Program was less than a year old when its participants began to clamor for some means of identifying their packaged products that had met the test requirements of the Safe Transit Committee. To answer the demand, the familiar and widely recognized red and yellow label was designed. Its purpose was two-fold. First, it was to tell handling personnel that the manufacturer had done his part to assure the safe arrival of his product. Second, it was to say, again to handling personnel, that the responsibility for safe delivery now rested in their hands.

Thirty-five words were chosen for telling this message. They are the now well known words "PRE-TESTED SAFE TRANSIT SHIPMENT" that appear in yellow within a red panel across the top of the label. These words are followed by the manufacturer's pledge, telling a story then new in shipping history — "The manufacturer certifies that this packaged product meets the pre-shipment testing standards established by the National Safe Transit Committee and will withstand normal transportation and handling hazards." Then in another red panel is the bold face type message — "MAKE SAFE HANDLING YOUR JOB!"

A public relations symbol

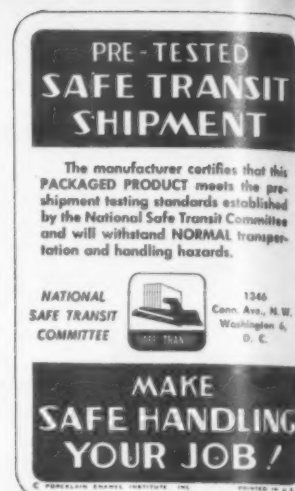
The label quickly gained its objective of improved handling and reduced damages, but it was to be no ordinary label. It was to assume additional important functions, even to becoming in itself a public relations program for the manufacturer whose packaged products it identifies. Today, it is an "on the road" salesman that is building good customer relations and increased sales for its users.

The recognition the label has achieved is the result of the cooperative efforts of many groups, and a continuing and intensive educational program.

To begin with, the manufacturer using the label has literally done his part. The Safe Transit label is not available to him until, on the basis of his packaged products meeting the pre-shipment tests, his company has been certified under the National Safe Transit Program. The pre-shipment tests simulate actual transit conditions and enable him to know prior to shipment whether or not his product is so designed and so packaged as to withstand the wear and tear of normal transit conditions.

As a certified company the manufacturer is committed to following the regulations that govern the use of the label. These were drawn up by the National Safe Transit Committee to assure that the "shipability" of a packaged product is properly determined before the label is affixed.

ST-6



The carriers cooperate

From its founding, the National Safe Transit Program was endorsed by leading carrier groups. These included Association of American Railroads, Railway Express Agency, American Trucking Associations, Inc., and Air Cargo, Inc. As cooperating groups, they immediately lent their support to the newly initiated labeling program. Poster replicas of the label were dispatched to all major handling points and bulletins describing the labeling program and the pre-shipment testing story behind it were sent to key personnel.

These early efforts are indicative of a Program that has continued ever since. The Safe Transit film, featuring the label, has been shown at major carrier meetings throughout the country. Individual railroads have purchased copies of the film for continuous use. Safe Transit Committee representatives are very often the principal speakers on carrier programs, and in the meetings of operating employees the entire Safe Transit Program is being given increasing attention. Recently the Railway Express Agency included a complete presentation of the Safe Transit story in their courses for the training of supervisors.

The Safe Transit car placard

Several months after the labeling program was underway, the Committee designed a companion piece to the label — the Safe Transit Car Placard. The placard is being used by manufacturers to identify carload shipments of pre-shipment tested packaged products. Typical of the recognition given the car placard, is this quote from a letter written by the prevention officer of one of the railroads to a number of his destination agents:

"Carload shipments are being made regularly by this company, destined to various points in our territory. This shipper has had some difficulties with regard to damage, and recently adopted the Safe Transit pre-shipment testing program. His crates have now met the Safe Transit tests and he will be using the National Safe Transit emblems to identify both crates and carload shipments.

"I am attaching a dozen of the Safe Transit car placards which I should appreciate your posting in our terminal yards with appropriate information to yardmen and others concerned."

MARCH • 1954 finish

Educational program expands

Stimulating the activities of carrier groups is part of the work of the Educational Division of the National Safe Transit Committee. This Division has as one of its primary objectives the publicizing of the pre-shipment testing Program and the Safe Transit label and car placard that attest to a manufacturer's participation. Its objective is that every handling employee, every claim agent, distributor and retailer will know the story behind the Program's emblems when he sees them.

This objective is fast being realized through an intensive educational program that includes a news service, articles in leading trade journals, special industry-wide programs, a Speakers' Bureau, direct mail campaigns, and promotional literature. An example of progress made in all important areas are these words from a leading appliance distributor serving over 100 retail outlets.

"The labels on cartons," he writes, "placed there by those manufacturers who have qualified under the NST Program, and which read, 'Make Safe Handling Your Job,' have created a lot of interest among our men. It is our belief that the sight of this label actually results in men all along the line giving better care to these particular crates.

"By using the label, the manufacturer is showing the carriers and his distributors that he is doing everything known to shipping science to see that his product is delivered to its final destination in good condition. We believe the carriers use more care when they know the manufacturer is doing his part. *It is only natural that we are going to give our business to the carriers who are working closely with the National Safe Transit Program*, and it goes without saying that the independent distributor is going to think a long time before he purchases merchandise and appliances from those manufacturers who are not sufficiently interested in their products to cooperate in this great program."

Cooperating in publicizing the labels are the manufacturers who have used over 30 million of them to identify their pre-shipment tested packaged products. Indicative of the label's attention getting value is the interest it has attracted in international shipping circles. While the label was designed to reduce damage to products during domestic shipping, many crates bearing the label have found their way into foreign ports. There they have attracted the attention of personnel completely unfamiliar with the program. The letters received each year from many countries confirm a long standing need for the pre-shipment testing standards established by the National Safe Transit Committee and the value of the label that signifies that these standards have been met.

The manufacturer, however, has not confined his activities to adoption of the pre-shipment testing program and use of the emblems. Nation-wide recognition of the Program has made the label not only an instrument for further reducing handling damages, but a means for improving customer relations. The label assures all concerned that the latest scientific testing methods are being utilized and this information is building good will wherever it is received.

A sales tool for manufacturers

More and more certified companies are recognizing the

finish MARCH • 1954

real sales appeal in the Safe Transit label and are integrating the symbol into their sales' presentations and customer-relations activities. Through articles in industry publications and house organs, and letters from company officials, they are calling attention to their certification and use of the label. Safe Transit is thus becoming an important part of the company's sales and public relations program.

Giving added support to the Safe Transit Program and its labeling activities is the interest of Government Bureaus. The Navy's Bureau of Supplies and Accounts has already included the Safe Transit test procedures in a specification covering domestic appliances. While the label is not necessarily required by companies supplying products under this specification, it is noted as a means for identifying pre-shipment tested packaged products.

Like the program, use of the label is entirely voluntary. Manufacturers are not required to use it in order to partici-

to Page 104 →

**NATIONAL
SAFE TRANSIT
COMMITTEE**
Presents

The
**NATIONAL
SAFE TRANSIT
PROGRAM**

Carriers, laboratories, and manufacturers use the NST film for education and public relations.

SHIPPING TRADE SUPERSTRONG MARK CONTAINERS

SYMBOL OF GOOD PACKAGING



CORRUGATED

SHIPPING CONTAINERS

Just what does the identifying SUPERSTRONG trade mark convey to the packaging expert?

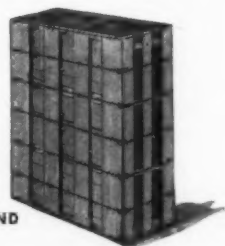
..SUPERSTRONG means a century of experience in packaging design and construction.

..SUPERSTRONG means assured service through strategically located plants, and of controlled quality through ownership of all operations.

..SUPERSTRONG means diversity through manufacture of virtually every type of corrugated, wire-bound or wooden container.

..SUPERSTRONG means sound engineering design and construction.

Be sure—specify SUPERSTRONG.



WIREBOUND



WOODEN

RATHBORNE, HAIR and RIDGWAY BOX CO.
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

A 1384-lb. drive-in and walk-up bank window counter has just been carried from the assembly line, and is being lowered upon specially engineered base of crate that will carry it safely in shipment. The special double sling used to carry the window counter was designed by A. A. Fishel, package engineer at Diebold. Until the company converted to pre-assembled shipping, this unit was shipped knocked-down and packed in seven different boxes and crates.



Pre-shipping assembly may simplify your packing problem

how one firm answered the problem of shipping cumbersome assemblies while cutting packing time 91%, packing costs 68%, and installation time up to 75%

by William Sanford • TRAFFIC MANAGER, DIEBOLD, INC., CANTON, OHIO



Safe transportation is a prime requisite at Diebold for its many products, including heavy and cumbersome steel bank drive-in and walk-up window counters.

Banks rightfully demand that such window counters be attractive and

unmarred since they are where so many customers are served. They have, in fact, replaced the banking floor itself for many bank customers, and, hence, must possess and maintain an inherent air of correctness unmarred by packing and shipping mishaps.

Even though Diebold walk-up and drive-in banking window counters

weigh up to 1384 lbs., we have defeated the shipping damage problem. At the same time we have drastically cut packing and installation costs.

This reformation was brought about by adopting packing methods and materials that permit us to pack and ship the window counter completely assembled, except for the glass, instead of packing them



After the one-piece half-mats that form the sides of the crate are nailed to the crate base, the top of the crate simply is placed in position and fastened, and the half-mats joined to each other to form a strong package.

knocked-down in from three to seven different containers as formerly.

Besides eliminating shipping damage due to container failure, we have cut packing man-time by 91%, overall packing costs up to 68%, and shipping container tare weight up to 44%. In the case of our two largest window counters, we have cut installation time by 75%.

Packing fully assembled window counters that weigh 1384 and 1236 pounds, respectively, economically and with safety is a feat when it is considered that the biggest model, for instance, measures 93" long overall, stands 59" high, is 18" wide, and is larger in dimension at the top than at the bottom!

Container engineers and our personnel collaborated in creating structurally strong and relatively light crates with sturdy bases, containing built-in wood blocking to carry the weight of the load.

A fully assembled window counter is carried by hoist from the end of the assembly line to the packing area, and lowered upon the crate base. The required special wooden interior packing is attached to keep the odd-shaped product steady during shipment and handling. The window

counter is also wrapped in heavy paper as protection against dust and moisture. Then two wirebound half-mats, each comprising one end and one-half of each side of the crate, are wrapped about the base and joined,

and the crate top then is fitted and nailed in position.

The package is then carried by an industrial truck to warehousing or to the shipping department. Even the heaviest crated windows, with a shipping weight of over 1700 lbs., are packed to stack three-high.

At the place of installation, the window need only be uncrated and lifted into place. Formerly, the several different containers in which it was packed knocked-down had to be opened and the window assembled. This feature alone has resulted in a 75% reduction—from 8 to 2 man-hours—in installation time.

In our plant, savings in packing time for the 1384-lb. unit, 1236-lb. unit, and 791-lb. unit, amounted to 91, 77½ and 70%, respectively, as compared to when we made our own containers from lumber bought on the open market. Over-all packing costs have been reduced, respectively, by 68, 46 and 33%, and shipping container tare weights by 24, 44 and 31%.

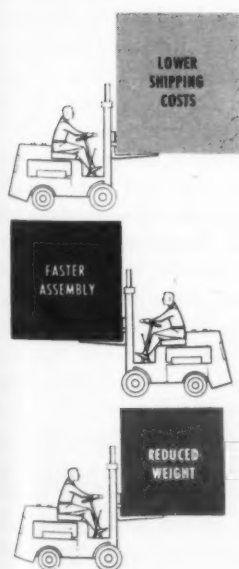
We have found "safe transit" for our beautifully finished drive-in and walk-up bank window counters by packing them fully assembled.

Skid runners on the base of the crate are extended so that the heavy packages like this, with a shipping weight of over 1700 lbs., are handled by standard fork lift trucks without special accessories.





No matter where they're bound
SHIP THEM WIREBOUND !
 and Stack 'em High As You Like



Modern handling methods call for quick and easy storage—in a minimum of space. The special Wirebound construction of strong steel wire and light, tough wood suits itself to modern methods of materials handling. You stack 'em fast, efficiently and high as you like. Shown above are some high-stacked Wirebound pallet boxes that are used for inter-plant shipments and parts storage. No other container is so perfectly suited to fork truck handling. They appeal to economy-minded management. We will be pleased to give you all details on versatile Wirebounds, regular or pallet boxes and crates.

MAIL THIS COUPON NOW!

Wirebound
BOXES & CRATES



WIREBOUND BOX MANUFACTURERS ASSOCIATION

Room 1100, 327 South LaSalle Street, Chicago, Illinois

- ☐ Have a sales engineer give me the whole story
☐ Send me a copy of "What to Expect from Wirebounds"

Name

Firm Name

Address

City, Zone and State



Shipper Hits Savings Jackpot with new Unitizing Method!

A Signode unitizing method that can work for you!

Shipping textile machine parts always was costly for one manufacturer until he called in a Signode fieldman. A new strapped Unit-Pack was designed and tested—and the manufacturer soon realized that he had hit the jackpot in savings! He saved

74.2% in labor	74.0% in overhead
57.7% in materials	55.2% in container cost
	26.0% in freight

Here's the story: The manufacturer was shipping two cylinders for spinning or twisting frames in a heavy wooden crate. Becoming conscious of shipping costs, he sought a way to reduce this expense. The Signode fieldman offered the solution—a double carton secured with tensional steel strapping.

Unitizing your shipments with steel strapping may turn expense into profits—damaged goods to safely delivered goods. It costs you nothing to find out what can be done. Send for our folder showing 6 BASIC WAYS OF UNITIZING!

SIGNODE Steel Strapping Co.

2639 N. Western Ave., Chicago 47, Ill.
In Canada: Canadian Steel Strapping Co. Ltd., Montreal • Toronto
Offices coast to coast—Foreign Subsidiaries and Distributors World-Wide

ST-12

Rheem installs new dryer line

→ from Page 25

The next operation is to bolt the dryer frame to the base of the shipping crate. The dryer continues on this crate base until the final pull-over cover frame and carton is added, thus making it ready for shipment. Also, at this point, either the gas or electric heating unit is installed after having been tested and thoroughly "burned off" so that objectionable fumes will not occur when the finished dryer is placed in operation.

The dryer continues along this line, with components being added at each assembly station. Side or stand-by conveyors are available onto which may be shunted units that are delayed in progress along the main line. At intervals where needed, the partially assembled unit passes stations where in-progress inspections are made. This limits final inspection to an overall check and test which can be accomplished in synchronization with production.

This conveyor line finally leads into an enclosed room where, after a final check and inspection, the dryer back and all necessary decals are installed. Here again a short stand-by conveyor section is used for shunting any units that may require some rework. After leaving this room, the dryer receives a final overall check, then passes onward to the crating station. When it leaves the line, it is ready for shipment.

Current dryer production is about 65 units each eight-hour shift. An average of about 35 employees are required to man the various sub-assembly and the final assembly line. As the new Wedgewood clothes dryer is a comparatively new product, ample room has been allowed along the line for expansion with market requirements.

Perhaps the outstanding features of the new Rheem dryer line are the speed, smoothness of operations, and the fact that it delivers a rather complicated product entirely pre-finished, inspected, tested, crated and ready for shipment—despite the fact that it has been in operation but a short time, and had to be "sandwiched"

MARCH • 1954 finish

into a "going" factory when it was laid out and tooled. The efficiency with which Rheem engineers blended "going" operations, such as the cleaning, finishing and press departments, with the new operations required in dryer production, and without interruption to other production lines, is a glowing tribute to that old saying . . . "Know-how is the smoothest road to quick success."

WEYERHAEUSER MAN "ON LOAN" TO DEPARTMENT OF COMMERCE

Bernard L. Orell, vice president, Weyerhaeuser Sales Co., has been appointed director of the Forest Products Division, Business and Defense Service Administration of the U. S. Department of Commerce.

Orell is on loan to the government from his company in accordance with a rotation system whereby experienced business men serve without compensation for periods of six months or longer.

'53 CONTAINER BUSINESS REACHED UNPRECEDENTED LEVEL — DEPT. OF COMMERCE

The heavy rate of operations in the third quarter indicated that the container business in 1953 reached an unprecedented level, according to the U. S. Department of Commerce.

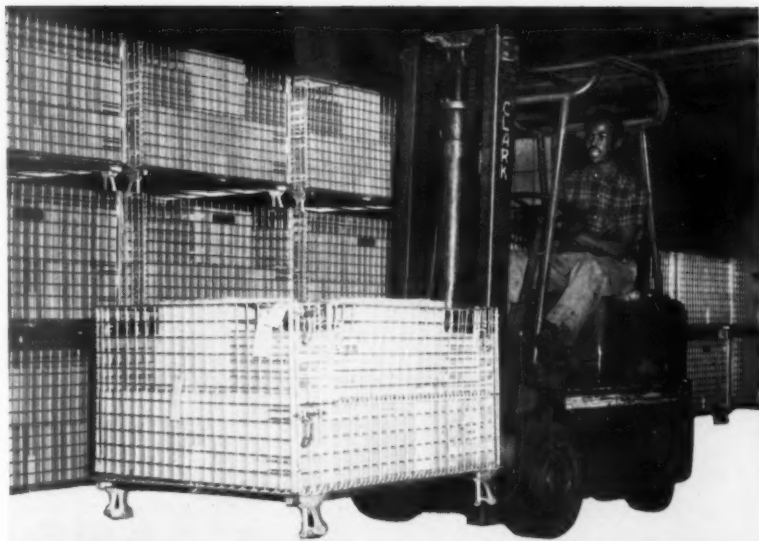
This conclusion is stated in the winter edition of the "Containers and Packaging" Industry Report issued by the Containers and Packaging Division of the Department's Business and Defense Administration.

The report showed that steel strapping sales were heavy with demand continuing strong from the improved second quarter volume. Shipments of wirebound boxes and crates, nailed wooden boxes and crates, and corrugated solid fibre shipping containers all showed increases over the same period in 1952.

SIGNODE FOUNDATION OFFERS FELLOWSHIP AT ILLINOIS TECH.

The Signode Foundation at the Illinois Institute of Technology, Chicago, has established a fellowship in the field of metallurgical engineer-

finish MARCH • 1954



PALLETAINERS



PROBLEM SOLVERS

GOT PRODUCTION LINE TROUBLES? Cluttered aisles? Uneven work flow? Palletainers may solve your problem. Natural receptacles for stampings, forgings or finished parts, they can be moved quick 'n easy from one work point to the next. And to the next and the next! Reinforced steel rod construction is virtually indestructible. Unusually fine protection for loads to 6000 lbs.

STORAGE SPACE YOUR HEADACHE? Palletainers can really help you there. New design of extra-strong malleable cast legs provides 8-way entry for fork trucks . . . assures solid, totter-free grip on unit below. You can stack 'em to the rafters in safety, yet see the contents at a glance. "Warehouse Palletainer" model has hinged front, can be emptied while at bottom of stack!

SHIPPING IMPORTANT TO YOU? That wonderful Palletainer construction eliminates all damage in transit under normal conditions. New locking device holds sides securely, regardless of load, cannot be released accidentally or lost in shipment. Light weight of unit holds freight costs 'way down and empty Palletainers fold to 1/4 space for further savings on return trips.

WHATEVER YOUR HANDLING PROBLEM let us show you how economically you can solve it with Palletainers. No obligation of any kind . . . write, wire or call us today.



UNION STEEL PRODUCTS
COMPANY ALBION, MICHIGAN

ing. The fellowship, for one academic year of full-time study leading to the degree of master of science, provides the recipient with \$1,450

plus tuition up to \$650 with an allowance for research equipment and supplies.

WOODEN BOX ASSOCIATION SEES CONTINUED GOOD BUSINESS

A feeling that the year 1954, will present opportunities for developing new markets was expressed by members of the National Wooden Box Association during their 55th annual

meeting held at the Drake Hotel, Chicago, January 21-22. Members and guests from 30 states participated in discussions of current and prospective markets, and heard a variety



CURT F. SETZER, ASSN. PRES.

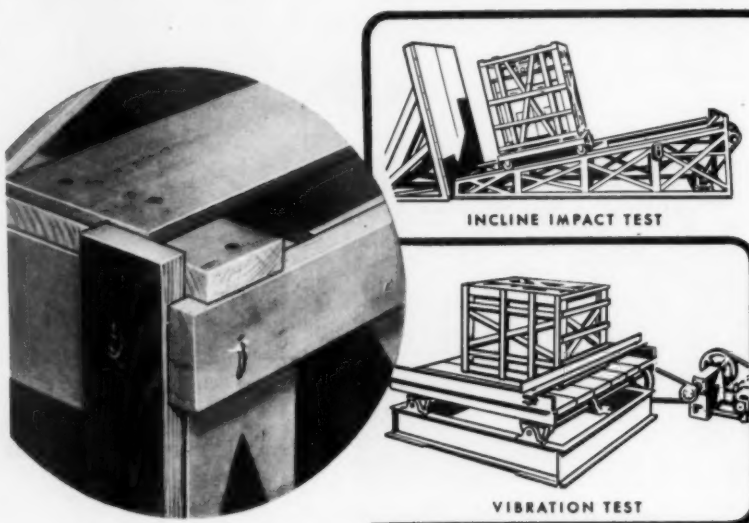
of speakers analyze business conditions and developments as they affect the whole wooden box industry.

Curt F. Setzer, director, Glenco Forest Products, Inc., Sacramento, Calif., was elected president of the Association. He succeeds R. F. Miles, president, Rathborne, Hair & Ridgway Box Co., Chicago.

Reelected to serve during 1954 were L. J. Chaffee, Chaffee Bros. Co., Oxford, Mass., vice president; J. D. Bronson, Cascade Lumber Co., Yakima, Wash., vice president; C. D. Hudson, Washington, D. C., executive vice president; and P. John Galbraith, Philadelphia, treasurer. In addition, Thomas Munroe, Moraine Box Co., Dayton, was elected to a vice presidency.

Retiring president Miles, in reporting to members, set the stage for adoption of an alert and aggressive association program to be enacted during 1954. "While I am not a crystal gazer," Miles said, "I am blessed with optimism. I think we will have just as good a year in 1954 as we did in 1953, although it probably will not come easy. It will be necessary to seek opportunities for serving old customers as well as developing new lines of business. Our future depends on a job well done."

Executive vice president Hudson stated that "the year 1954 offers the most promising opportunities in years for favorable results from the Association action in the field of market research and promotion." He added



BIGELOW-GARVEY EXCLUSIVE TIGHT CORNER HINGE *stands up under scientific laboratory testing!*

● B-G CRATES and PALLET BOXES assure you the utmost in **STRENGTH** and **SAFETY** in the shipping and storage of your products.

● B-G Containers are **SCIENTIFICALLY ENGINEERED** and **TESTED** in our new, modern laboratory, **APPROVED** by the **NATIONAL SAFE TRANSIT COMMITTEE**.

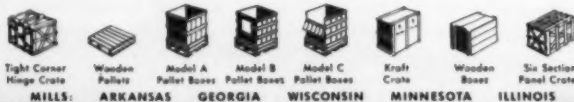
● B-G Unique **TIGHT CORNER** feature makes possible a sturdy, collapsible hinge container assuring **GREATEST**

ECONOMY in your shipping, handling and storage problems.

● B-G Tight Corner Containers are **INDIVIDUALLY ENGINEERED** to fit your product.

● B-G invites your inquiries for further information. Sales engineer will call upon request.

● B-G offers without obligation the benefits of **30 YEARS EXPERIENCE** in **DEVELOPING BETTER, STRONGER** and more **EFFICIENT Shipping and Storage CONTAINERS**.



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General Office and Laboratory
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Whitehall
4-5252

that the factors creating this opportunity are: (1) rapid increase in palletization of the nation's industrial output, (2) decreased production in government-owned box plants, (3) possibility of securing business now produced in captive box plants operated by private industry, (4) trends toward greater acceptability of containers produced by combining wood with other materials, and (5) new products or redesigned products planned for the 1954 market.

POSTPONE INDUSTRY-WIDE SAFE TRANSIT COMMITTEE

Announcement has been made by the National Safe Transit program committee that the 1954 Industry-Wide Safe Transit Meeting, originally scheduled for March, has been indefinitely postponed due to complications in connection with the dates selected. No new date will be established until further consideration by the NST policy committee.

HILDEBRAND TO UNION STEEL MATERIALS HANDLING POST

W. C. Neumann, general sales manager, Union Steel Products Co., Albion, Mich., has announced the appointment of Herbert W. Hildebrand as sales manager of the materials handling equipment division.

Formerly USP's Washington representative, Hildebrand has taken over the post formerly held by Charles F. Clark, who has taken over the responsibilities as sales manager of hardware and consumer products.

ACME STEEL UPS KARSTENS

Percy L. Dafoe, vice president and sales manager of Acme Steel Products Division, Chicago, has announced the promotion of Albert G. Karstens to national account supervisor.

A. G. KARSTENS



H. W. HILDEBRAND



finish MARCH • 1954



1 generallift pallet crate

replaced 6 heavy nailed crates

cut packaging costs 50%
reduced shipping costs 25%

McCord Corporation, Plymouth, Indiana, solved both a packaging and a materials handling problem with the Generallift Pallet Crate shown above. Conferences with General Packaging and Sales Engineers produced a crate which held 24 radiators, packed easily, and could be handled by fork-lift from the shipping room all the way to assembly lines. It formerly took 24 heavy nailed crates and from 24 to 30 hours of labor to ready 96 radiators for shipment. Packing the same number in Generallift Pallet Crates takes only 4 hours.

This is only one example of the many packaging problems solved every day—at a saving—in General Box Company's two fine Industrial Packaging Laboratories. General Box packaging experts stand ready to help *you* cut packaging costs, too. Write for complete details.

Find out how other manufacturers are cutting packaging costs. Write for your free copy of "The General Box."



General Box COMPANY
1823 Miner Street
DES PLAINES, ILL.

Factories: Cincinnati; Denville, N. J.; Detroit, East St. Louis, Kansas City, Louisville, Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston, Texas.

ENGINEERED SHIPPING CONTAINERS FOR EVERY SHIPPING NEED

- Generallift Pallet Boxes
- Corrugated Fiber Boxes
- All-Sound Boxes
- Cleated Corrugated and Watkins-Type Boxes
- Wirebound Crates and Boxes

ST-15

SAFE TRANSIT NEWS

NATIONAL SAFE TRANSIT COMMITTEE



DuPont Circle Building, 1346 Conn. Ave., N.W., Washington 6, D. C.

New Radio-Television Manufacturer Certified - The Appliance and Electronics Division of Avco Manufacturing Corporation, Cincinnati, Ohio, was recently certified under the National Safe Transit Program. The company is the 144th to adopt the pre-shipment testing Program.

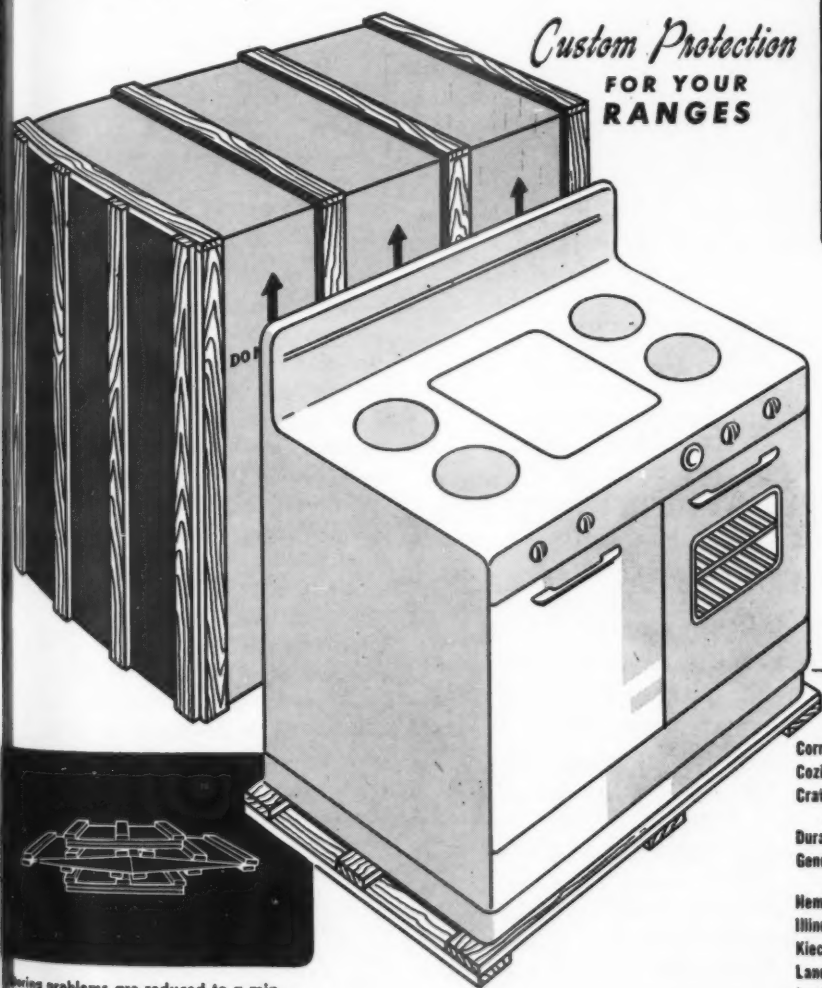
NEW NAVY SPECIFICATION INCLUDES SAFE TRANSIT TEST PROCEDURES

In February, 1953, companies certified under the National Safe Transit Program received for study and comment a proposed Federal Specification incorporating the NST Test Procedures. Drafted by the Navy Department's Bureau of Supplies and Accounts, the specification covered the packaging and packing of Porcelain Enamel Products and major household appliances. Now officially approved as an interim specification, it will be ready for distribution by March 15th. The specification, RR-P-0021 (Navy - S&A) specifies that the containers packed with the appliance or product shall be test cycled in accordance with the Safe Transit Test Procedures. Choice of the design and type shipping container, the construction materials and methods, and the packing of the appliance or products and packaged loose or disassembled items is left to the judgment and prudence of the manufacturer. The issuance of the performance type specification culminates a long period of study during which the Safe Transit Committee cooperated closely with Navy Department officials. The Committee is confident that the new specification will be mutually beneficial to government and industry. It further substantiates the methods and procedures of the Safe Transit Program, which have already received the attention of shipping authorities throughout the country.

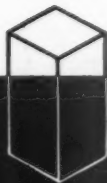
Test Procedure for Loaded Freight Cars - Earlier the Committee announced that it was preparing in booklet form its "Procedure for Pre-Shipment Testing of Basic Carloading". The Committee is pleased to announce that the booklet is now ready for distribution and that copies will be mailed this month to participants in the National Safe Transit Program. Non-certified companies may obtain copies at 25¢ per copy by writing the Committee headquarters, Washington, D. C. It is emphasized, however, that this testing procedure, to be known as Project 1B, can only be properly used in conjunction with Projects 1 and 1A, that cover the packaged product consisting of a single manufactured product with the necessary packing and container. The new test procedures give attention to pre-shipment tests on basic carloading, where consideration of the crushing force that builds up in improperly loaded cars is of primary importance. Project 1B combined with the regular NST tests on individual packaged products, provides a testing program that will bring in-transit damages to a new minimum.

NST Program Highlighted in University Programs - The country's educational institutions are giving increasing attention to material handling, packaging, and transportation as evidenced by special courses and programs now offered. The Packing and Packaging Design course now in session at New York University includes a showing of the National Safe Transit film. W. B. Keefe of the NST Technical Planning Division has assisted Purdue University in its organization of an Institute for Packaging Personnel, which was underway on February 8th. R. F. Bisbee, General Chairman of the NST Committee was one of the principal speakers at the Joint Industry Conference recently sponsored by the Preservation-Packing Committee of General Motors Corporation and Materials Management Center, Wayne University. The National Safe Transit Committee participates in these programs as part of its public relations program.

Only Watkins Containers provide *all* of these many desirable and necessary features, and at no greater cost than other types of containers. Ship your carefully manufactured products safely and economically—ship them the "Watkins Way."



...ing problems are reduced to a minimum because of the 3-section design which provides for flat, close nesting.



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has the
container
for your
shipping
problem

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. 10901 Russett Street, Oakland, California
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General Box Co. 1825 Miner St., Des Plaines, Illinois, and
. 16th and Maple Sts., Louisville, Kentucky
Hemb & Martin Mfg. Co. Watseka, Illinois
Illinois Box & Crate Co. 811 Center Street, Plainfield, Illinois
Kieckhefer Box & Lumber Co. 1715 West Canal Street, Milwaukee, Wis.
Lane Container Corp. 10212 Denton Road, Dallas, Texas
Lewisburg Container Co. 243 Singer Street, Lewisburg, Ohio
Livingston Wood Manufacturing, Ltd. Tillsonburg, Ontario, Canada
Love Mfg., Inc. 608 South Commerce Street, Wichita, Kansas
Pennsylvania Box & Lumber Co. 2331 N. Bodine St., Philadelphia 33, Pa.
Utility Crate Corporation 1985 E. 16th Street, Los Angeles 21, California

—an inquiry to any of these companies will get prompt attention—

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Wanted to buy complete tooling out-
fit for the manufacture of washing
machines; presses and dies for sinks
and lavatories.

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Apartado Postal #909
Monterrey, N.L., Mexico

FOR SALE

One continuous, straight through,
porcelain enamel, gas-fired furnace,
slightly used, with many new com-
ponent parts. Size approximately
100' long overall, 3'6" wide, 5'6"
high, inside measurements. Burning
zone 30' long with pre-heat and cool-
ing zones 35' long each. Dismantled
and stored in our warehouse.

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Trenton, New Jersey
Trenton 6-9241

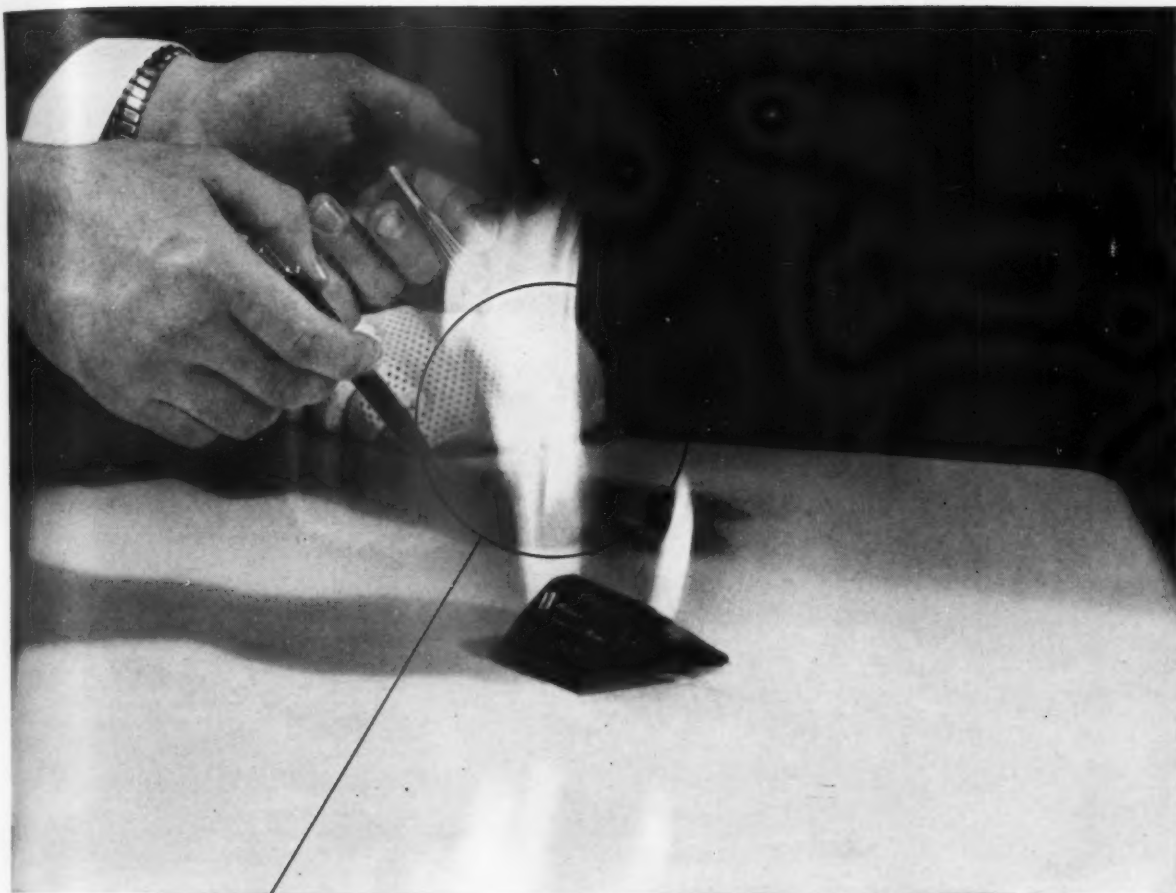
Safe Transit Label

→ from Page ST-7

pate in the Safe Transit Program.
Growing enthusiasm for the label,
however, becomes increasingly evi-
dent as more and more companies
are certified under the Program.
There has been a decided shift in
emphasis on the part of the inquiring
manufacturer. Once the question was,
"What must I do to share in this co-
operative effort?" Since the initiation
of the labeling program the question
most frequently asked is "What must
I do to use the Safe Transit label?"

What the manufacturer must do, as
all participants know, is adopt the
pre-shipment testing program that
will aid him in designing and pack-
aging his products for Safe Transit,
and serve as quality control tool.
Then as his packaged products roll
off the assembly lines, designed and
packaged to meet the test require-
ments, he may affix to them the red
and yellow label that from assembly
line to customer will tell his story of
careful manufacturing practices.

Benefits, of course, are accruing
for all participants as more and more
leading names in the major appli-
ance, allied metal products, radio
and television fields affix the label to
their packaged products.



* This Flame Can Be a Strong Sales Point for You

A Porcelain Enameled finish offers so many unusual sales features for your products that one of its biggest advantages is often overlooked.

It can take heat. Porcelain Enamel doesn't burn, blister or discolor. Even flames won't damage the surface in any way.

Since this finish is processed at 1550 F, it will withstand any temperature it is likely to encounter in home service. Burning cigarettes or even hot electric irons don't harm its hard, glossy surface.

This is only one of many reasons why Porcelain Enamel gives you extra sales advantages. It is smooth, bright and attractive too—and so easy to keep clean.

Colors never "fade"—even after years of use. • Acid-resisting Porcelain Enamel is not damaged by fruit juices or alcohol.

UNIFORM QUALITIES

Of course, the metal beneath the Porcelain Enameled surface must have excellent bonding qualities, flatness, and uniform fabricating characteristics. That's why more manufacturers have used more Armco Enameling Iron over a longer period than any other enameling base. That is why too it has become known as the "World's Standard Enameling Iron."

ARMCO STEEL CORPORATION

2924 CURTIS STREET, MIDDLETOWN, OHIO
EXPORT: THE ARMCO INTERNATIONAL CORPORATION



\$64 QUESTION

...for men responsible for "BEST SELLERS" in '55



You can use any or all, interchangeably, with MONOTUBE® Electric Range Units

This matter of *surface cooking* on electric ranges is coming in for a lot of attention these days. And well it should—for it is the industry's *one best way* to obsolete existing equipment and expand the "new range" market in the next few years.

Toward this end, you'll see *infinite control* on a lot of ranges—on leader models as well as the top lines. And the same is true of special devices for *quick heating* and *controlled timing*. And, because costs will be closely watched, you'll also see 5 and 7-position switches widely used. Only one unit, the *Monotube*, lends itself to all systems. Only the Monotube gives you a consistent story of *all-over heating* irrespective of the controls used—

extremely important in selling the whole line.

That *users* like Monotube's all-over heat pattern—also its large cooking surface area and "swing-away" hinging for easy cleaning—is borne out by the record of electric range sales in recent years. For three years in a row, ranges equipped with *single-coil* burners have outsold all other types combined.

And that's just half the story—for still *better* Monotubes are on the way. It will pay you to get all the facts if you're interested in producing "best sellers" for the years ahead.



TUTTLE and KIFT, INC.
A Subsidiary of Ferro Corporation

1815 N. MONITOR AVE. • CHICAGO 39, ILLINOIS

April • 1954

VOL. II • NO. 4

MONTHLY TRADE PUBLICATION

Established January 1944

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Chicago 1

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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

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BPA

NBP

Finish

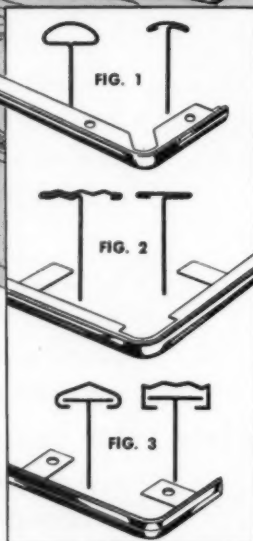
**METAL PRODUCTS MANUFACTURING
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sparking sales with STAINLESS*



*Another in a series showing case histories of product appeal achieved thru metal mouldings.

Manufacturing necessities can be turned into selling assets. PYRAMID Tee Mouldings are easily fitted between panels required in most appliance construction—thus hiding ugly seams and adding Sales Spark. (fig. 1) Many standard tee mouldings are available in various designs and face widths...Formed with flanges notched and pierced to exact requirements. (fig. 2) Long tabs spot welded to leg of standard section, engineered to meet your specific application needs. (fig. 3) Low cost stock "snap-on" mouldings are simple to install with the use of T type clips. Write or call today for more information concerning these and other versatile methods of adding sales appeal.



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No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

Without obligation, please send copy of
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from the
Editor's Mail

continuing interest in news
of trade shows and processes

Gentlemen:

We would like to remain on your mailing list, as the news of certain trade shows and processes would be of continuing interest to us in our manufacture of laboratory and other special sheet metal products for the instrument and hospital field.

E. M. Baker
The Baker Company, Inc.
Maplewood, Maine

service to the industry

Gentlemen:

I note from the January issue of *finish* that it is your 10th anniversary. I would like to congratulate you on the wonderful progress which you have made with the magazine, the great service that you have rendered the industry, and to wish you much success in the future.

H. H. Wineburgh
President
Texlite, Inc.
Dallas, Texas

a splendid trade paper

Gentlemen:

I should have dropped you a line long before this, particularly since it is the 10th anniversary of *finish* magazine. You certainly have given our industry a splendid trade paper. I have been impressed with its growth and value over the years.

G. S. Blome
Vice President
The Enamel Products Co.
Cleveland, Ohio

wants on mailing list

Gentlemen:

We would like very much to be placed on your distribution list. We saw our first copy in the office of Colonel Palmer, Procurement Division, Wright-Patterson Air Force Base, and were definitely impressed.

H. J. Lee
Works Manager
Gremco, Inc.
Fort Worth, Texas

APRIL • 1954 *finish*

FOR COMPLEX STAMPING AND PRODUCTION HEADACHES

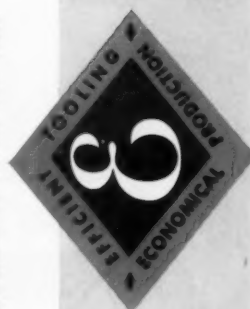
EFFICIENT Tooling

● A good prescription for your "tough", troublesome stamping problems . . . is EFFICIENT TOOLING. You can eliminate production headaches—simplify your stamping operations—reduce production costs—with ingenious well-constructed dies and tools by EFFICIENT.

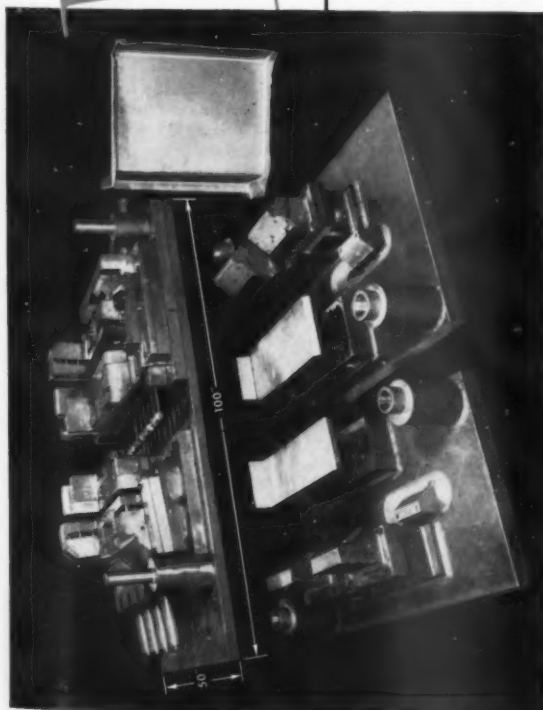
Our organization has the know-how, the experience, the engineering skill to tool your most complicated parts to your best advantage.

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Consult us on your tooling problems or write for full information.

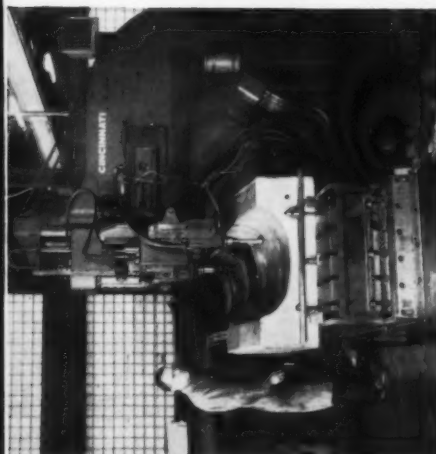


THE EFFICIENT TOOL & DIE COMPANY
9314 ELIZABETH AVENUE • CLEVELAND 5, OHIO • PHONE DIAMOND 1-5150



ABOVE: Typical tooling job is the Cam Flange Die shown above. This is an adjustable die to cam flange both sides of three different sizes of range tops with one stroke of the press for each top.

LEFT: Showing work done on a typical job—using a 28" x 96" Cincinnati Vertical Hydro-Tel, with automatic tracer and depth control.



**Designers
and Builders of
Dies, Tools, Jigs,
Fixtures and Special
Machines**



when you buy ESSAK

In metal cleaners there's no substitute for performance. That's why price per pound can be misleading . . . can be a costly mistake when it is the sole consideration given to metal cleaner purchase. ESSAK metal cleaners combine both of these important factors . . . performance *and* price-per-pound. The result is a maximum yield from metal cleaning operations, and overall costs that are not only highly competitive with the so-called "lower price" cleaners but frequently less in the long run. So, be a wise metal cleaner purchaser. Buy a known standard of quality. Buy cleaners that are tailor-made to suit your need. Buy ESSAK.

ESSAK BOND-CLEEN

is a product which provides an even crystalline coat of fine phosphate particles chemically bonded to the surface of the steel. This in turn serves as a matrix for the paint, which, when baked on, has adhesion properties second to none.

ESSAK NAMEL-CLEEN

has proved highly successful for cleaning steel during pickling for Porcelain Enameling. NAMEL-CLEEN possesses outstanding emulsification properties and characteristics that assure long life in use . . . a unique balance seldom found in a proprietary product.

ESSAK POWER-CLEEN

will provide economical operation and improved production, due to higher cleaning efficiency and longer life. POWER-CLEEN has been used successfully in porcelain enameling, painting and cleaning prior to electroplating, and has many general purpose applications where barrel cleaning and continuous cleaning units are utilized. POWER-CLEEN will remove oils, drawing compounds and greases quickly, economically, and efficiently. Give yourself the best finish possible. Use POWER-CLEEN to obtain it.

ESSAK SPRA-CLEEN

is a well balanced, potent, spray cleaner which provides complete solubility, long life and unexcelled results. SPRA-CLEEN has been used successfully in railroad cleaning, stamping plants, food processing plants, etc. This experience assures you of complete positive performance and an end product of finest quality.

ESSAK LECTRO-CLEEN

is a well balanced potent electro cleaner developed for use prior to electroplating. LECTRO-CLEEN has the necessary conductivity to reach corners and other hard to get to areas. It has been used successfully on small appliances such as toasters, irons, hardware, radio and T.V. components, and on metal furniture, etc.

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is a heavy duty soak cleaner which has high solubility and long life. STRIP-ALL has been used successfully in paint stripping, and for removal of heavy greases and oils found in automobile and truck maintenance and railroad shops. STRIP-ALL will perform at its best under heavy and hard to remove soil conditions.

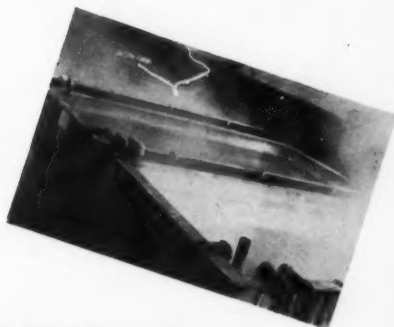


ESSAK STEEL & CHEMICAL CO.

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PEnsacola 6-3400

serving the metal products industry for over 10 years



METAL CLEANERS

YOU GET

highest quality products

You get what you pay for and then some in ESSAK metal cleaners. You get cleaners that are chemically compounded from the finest raw materials available. You get uniformity of product that assures you of uniformity in your metal cleaning operations. Any experienced production man knows how important this is from a standpoint of finished product quality as well as costs.

performance

The important question about any metal cleaner is "Is it right for the job?" ESSAK metal cleaners prove in performance that they are chemically compounded to be most effective for the purpose for which your ESSAK engineer recommends them. Try them — and judge the results for yourself.

service

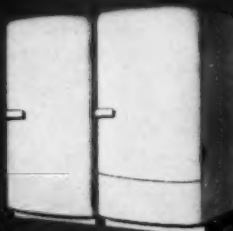
ESSAK as an organization works on the premise that service is the backbone of sales. ESSAK service starts with a recommendation based on your individual need. It follows through to assure you of effective cleaning operations. It never ends.

THIS LABEL IS YOUR
GUARANTEE OF UNIFORM
PRODUCT QUALITY IN
METAL CLEANERS



How To Make Casings for

WASHERS
DRYERS
FREEZERS
REFRIGERATORS
UNIT HEATERS



**BATH OPEN THROAT
SINGLE WING SEQUENCE
PRESS IS IDEAL FOR
PRODUCING DOMESTIC
APPLIANCE CASINGS AND
INDUSTRIAL HOUSINGS**

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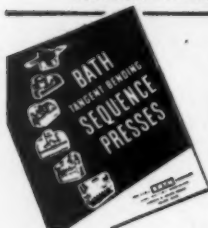
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MEETINGS

LUBRICATION ENGINEERS

American Society of Lubrication
Engineers, annual meeting and ex-
hibit, Cincinnati, April 5-7.

EDISON ELECTRIC INSTITUTE

Edison Electric Institute, annual
sales conference, Edgewater Beach
Hotel, Chicago, April 5-8.

PACKAGING EXPOSITION

American Management Associa-
tion, national packaging exposition
and conference, Convention Hall, At-
lantic City, April 5-8.

CERAMIC SOCIETY MEETING

American Ceramic Society, annual
meeting, Palmer House, Chicago,
April 19-23.

TOOL ENGINEERS EXPOSITION

American Society of Tool Engi-
neers, industrial exposition, Phila-
delphia's Convention Center, April
26-30.

WELDING EXPOSITION

American Welding Society, spring
technical meeting and welding and
allied industry exposition, Memorial
Auditorium, Buffalo, May 4-7.

ENAMELERS CLUB MEETINGS

Central District Enamelers Club,
dinner-meeting, Allerton Hotel, Cleve-
land, Ohio, May 7.

Eastern Enamelers Club, luncheon-
meeting, Sylvania Hotel Philadelphia,
May 8.

Midwest Enamelers Club, annual
Maypole Party, Sportsman Golf Club,
Chicago, May 21.

CONFERENCE FOR ENGINEERS

Ohio State University, first annual
conference for engineers, Columbus,
Ohio, May 7.

LP-GAS CONVENTION

Liquefied Petroleum Gas Associa-
tion, annual convention and appliance
exhibit, Conrad Hilton Hotel, Chi-
cago, May 9-12.

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MORE THAN A METAL, IT'S A METHOD

Nickeloid Metals—brilliant pre-finished metals in sheets or coils—are ready-plated with the finest, quality plating of chromium, nickel, copper or brass. Being finished, they are ready for fabrication and assembly. They require no further finishing. They are durable, easy to fabricate. Nickeloid Metals provide a production short-cut that usually provides a basic economy in cost. Thus Nickeloid Metals are more than a raw material . . . they represent a streamlined method of production: raw material to finished part. Many operations are eliminated or short cut. Nickeloid Metals deserve further study on the part of every progressive manufacturer.

Nickeloid pre-plated finishes available in these base metals: Steel, Zinc, Brass, Copper, or Aluminum.



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The appeal to the buyer of products that have that smart, modern finish, is undeniable. The list of successful applications that have employed Nickeloid Metals to enhance eye appeal is long. From buttons to rotisseries . . . smart designers and alert manufacturers are cashing in on the basic production economy and sales appeal offered by these pre-plated metals. Our representatives, located in most principal cities, will be glad to show you samples of successful applications. They will be glad to submit working samples of metal for experimental purposes. They will be glad to give you the benefit of Nickeloid's half century of experience in the fabrication of these brilliant, gleaming, durable metals.

Write for new Booklet covering properties, uses and fabrication techniques for Nickeloid Metals.

Quality Metals Since 1898

AMERICAN NICKELOID COMPANY

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finish APRIL • 1954



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thin skins make the toughest hides

TITANOX titanium dioxide puts porcelain into the *film* category. This compound, when properly formulated into porcelain enamel, hides steel appliance surfaces so well that thick coatings are not required.

Modern titania porcelain enamel is unsurpassed as the tough beauty finish for modern sinks, stoves, appliance cabinets and wherever water, heat, household acids and alkalies appear. TITANOX titanium dioxides that do this job best are TITANOX-TG and TITANOX-TG-400 for they are

designed specifically for porcelain enamels.

Consult with our Technical Service Department for the solution to any problems you may have concerning the formulation of modern porcelain finishes. Titanium Pigment Corporation, 111 Broadway, New York 6, N.Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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the brightest name in the finish

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TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY



Porcelain enamel can help you sell more!

ROOM CONDITIONERS



BASE... Here a single coat of Porcelain enamel assures life-time protection against rust and corrosion.

WEATHERHOOD... another place for Porcelain enamel. Decorative, highly weather resistant, easily cleaned, and a permanent finish.

Rust and corrosion are stopped cold by a single coating of Porcelain enamel. And it costs so little to give users this extra protection against early deterioration. In a highly competitive field such as *room conditioning*, this could make a big difference in a company's sales—especially so in areas where salt-laden moisture in the air plays havoc with ordinary materials and finishes.

Several companies are already experimenting with Porcelain enameled *bases* for their room conditioners. Some are considering it for the *weatherhood*, two or three for the *entire cabinet*. This could be the big news of the industry a year hence... and welcome news to buyers looking for top value in room conditioners.

Designers will do well to consider Porcelain enamel in their plans for "best sellers". While there's nothing difficult about it, you do have to *plan* for Porcelain enamel. Why not call us in and let us help you?

PE belongs in your PRODUCT-PLANNING

Remember only Porcelain enamel, the fused-in finish, gives you all these advantages:

1. Permanent, handsome appearance
2. Rust and corrosion resistance
3. High alkali and acid resistance
4. Easy cleaning and low maintenance
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7. Wide consumer acceptance



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ACP metal protective chemicals include: protective coating chemicals for steel, zinc and aluminum; metal cleaners and rust removers; final rinse controls; pickling acid inhibitors; copper coating chemicals; soldering fluxes; alkali cleaners and addition agents; copper stripping and brightening solutions.

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"GRANODINE"® zinc phosphate coatings improve paint adhesion on automobiles, refrigerators, projectiles, rockets, and many other steel and iron fabricated units or components.

"LITHOFORM"® zinc phosphate coatings, make paint stick to galvanized iron and other zinc and cadmium surfaces.

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"THERMOIL GRANODINE"® manganese-iron phosphate coatings provide both rust proofing and wear resistance — anti-galling, safe break-in, friction on rubbing parts.

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"GRANODRAW"® zinc phosphate coatings make possible improved drawing, cold forming and extrusion on such steel products as sheets for stamping, bumpers, parts to be formed, prior to plating or painting, cartridge cases, etc.

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In Protective Coatings For Metals . . .*

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*The G-E refrigerator
has come a long way
since 1933*



... and so has Du Pont DULUX[®] enamel!

GENERAL ELECTRIC'S famous "monitor top" refrigerator delighted homemakers with its efficiency and good looks back in 1933. But finding *new ways* to make kitchens more beautiful, more pleasant to be in . . . *new ways* to give America's women more and more leisure . . . has been among the basic aims of General Electric over the years. That's why today's General Electric refrigerator, with its new revolving shelves, is a marvel of streamlined efficiency and compactness that the 1933 housewife could not even dream of.

And so it is with America's leading home appliance finish—Du Pont DULUX Enamel. Constant research over the years by Du Pont chemists has resulted in a finish with rugged resistance to chipping, cracking, scratching and staining. *Now* DULUX is easier to clean . . . keeps its glistening white beauty longer than ever before! That's why the DULUX of today meets the most exacting requirements of today's topflight appliance manufacturers. E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.



REG. U.S. PAT. OFF.

"DULUX" ENAMEL

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finish APRIL • 1954

America's leading home appliance finish

. . . has helped sell over 36,000,000 refrigerators!

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finish SUGGESTION BOX

Plastic metal for forming dies, drill fixtures and jigs

A NEW putty-like material, consisting of fine steel powders and a special plastic, can be used to make permanent and durable forming dies, drill jigs, fixtures, and similar products.

There are many additional uses, including plug gauges, rubber molds, duplicating machine masters, models, prototypes, and for caulking large holes in metal castings.

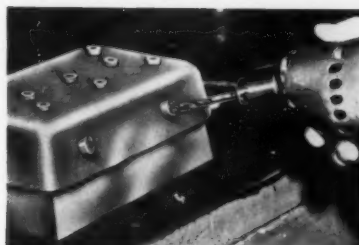
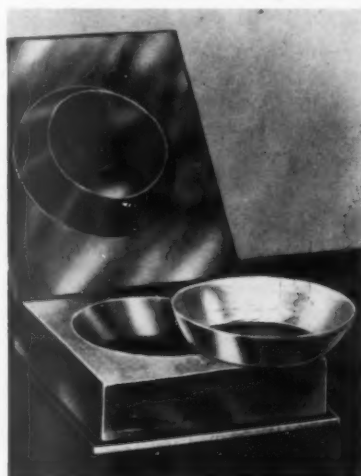
The plastic metal is as easy to use as modeling clay. No heat or pressure is required. After the desired shape has been formed, the new material becomes a strong, tough and rigid "metallic" piece in about two hours. It makes a precision form of the original without distortion or shrinkage. It can be sawed, drilled,

tapped, threaded, and ground with conventional metalworking equipment.

It is stated that a large mass of the plastic metal can be applied to a vertical surface without running or sagging. It has excellent adherence to steel and has high impact, tensile and compressive strength. If additional hardness is required, the material can be chrome, nickel or copper plated or metallized by conventional methods.

Where an error of location has been made in drilling, or an excess amount of steel removed from a machined surface, the new material can be simply spread on the surface, allowed to harden, and then machined the same as the original metal.

Left below: Holes in this casting, which were made through an error of location in drilling, are simply filled with the new plastic metal. Right below: This forming die was molded in a short time with the new material which has high tensile, impact and compressive strength.



This photo shows versatility with which the plastic metal can be formed to nearly every shape and contour for holding a piece to be drilled, milled, ground, etc.

While soft, it can be formed into any shape, and then machined or finished if desired.

Source for more information on this plastic metal may be obtained by writing to finish.

These photos show three simple steps in making a precision metal form of the original.





Paint spray booths; and overhead air make-up system.

space - saving

Cincinnati
FINISHING SYSTEM

*handles both prime
and finish operations*

...at Caloric Stove Corporation

Saving floor space is a valuable asset to Caloric as to all major manufacturers. Cincinnati engineers designed a complete finishing system with this need uppermost in their minds. The operation begins with a 5-stage washer capable of handling Caloric's present production and yet with the capacity of doubling the output whenever it becomes necessary.

The second unit consists of a 400° gas-fired recirculating air dry-off system to dry the work completely after phosphatizing.

Third, the work passes through a huge combined air makeup and pressurized room consisting of two large spraying areas.

Either prime or finish coats may be applied while the work is carried on a 1054 foot conveyor designed to carry the work continuously through the entire operation.

The material is then elevated up through a 500° floor supported oven leaving a working area underneath with a 9 foot clearance for parts storage and assembly operations.

This unit is also a gas fired recirculating design having 300 feet of conveyor inside the oven permitting a full half hour of baking time at 500°.

A complete, properly designed finishing system can give you increased production at lower costs, more uniform results and greatly reduced handling costs . . . save you space at the same time. Consult Cincinnati . . . for a complete finishing system or any part, engineered-fabricated—installed . . . to your complete satisfaction.

OPERATIONS

- 1 Cleaning & Phosphatizing
- 2 Pre-Paint Drying Oven
- 3 Air Makeup and Paint Spray Booth
- 4 Paint Bake Oven
- 5 Completely Conveyorized



Prime coat spray application.



Parts emerge from dry-off, prior to painting.

Cincinnati

CLEANING & FINISHING MACHINERY CO., INC.

2004 HAGEMAN ST. SHARONVILLE, OHIO

For comprehensive catalog

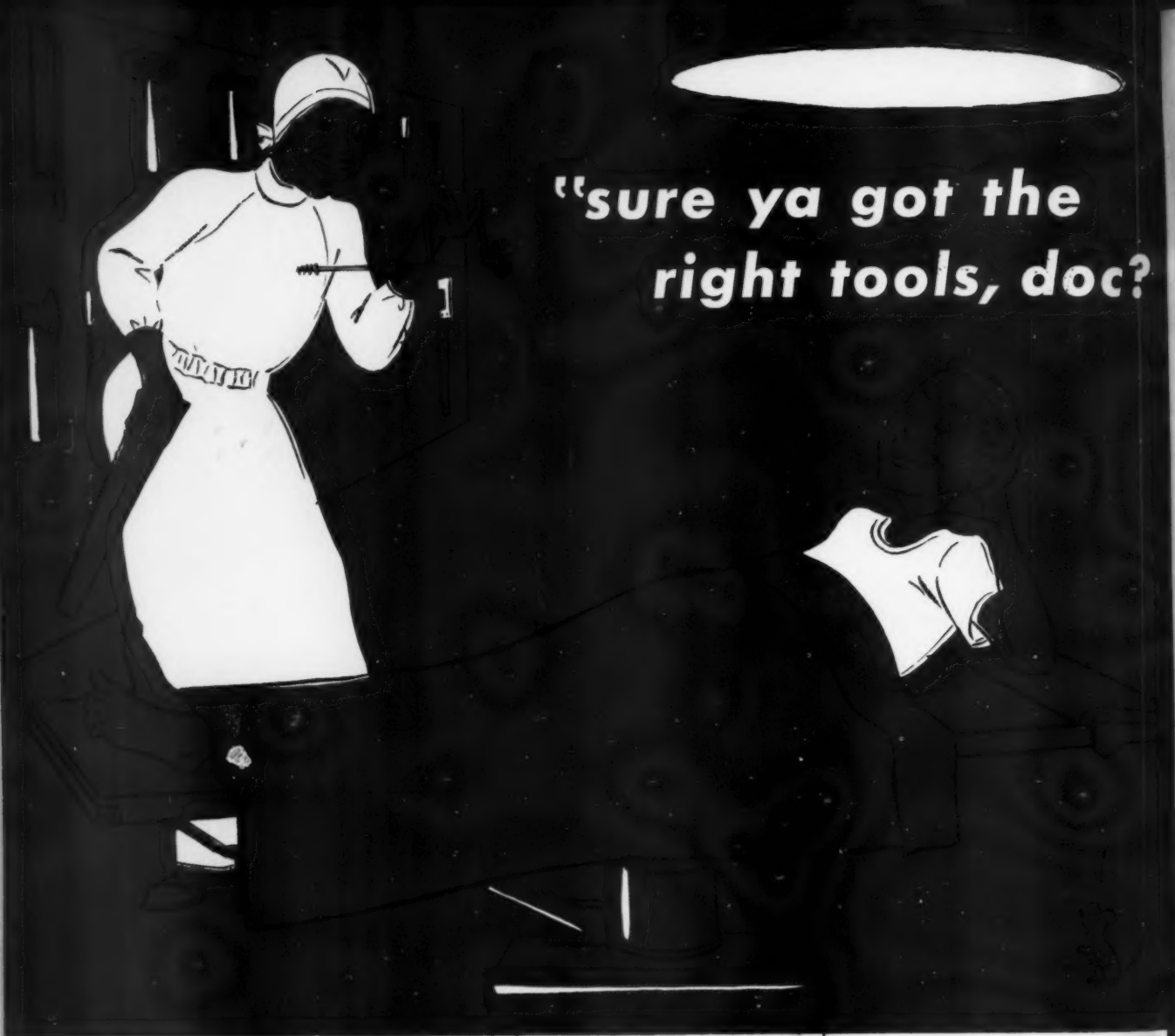
"COMPLETE FINISHING SYSTEMS"

write today!

THE finish **spotlight**



To most people, a periscope is a device built into a submarine, but to O'Keefe & Merritt it's an important sales feature on their new Hi-Vue gas ranges. This feature allows the housewife to look inside her oven — without effort, without stooping, and without interrupting her kitchen tasks.



**"sure ya got the
right tools, doc?"**

The right tools are important to the success of any job. In enameling it's essential to have the right frit whether it be for ranges, refrigerators, washers, driers, water heaters, bath tubs, sinks, signs or complete architectural installations.

Chicago Vit has developed a wide variety of frits for a wide variety of uses. And, each frit was made for a purpose . . . to do a certain job. When Chicago Vit recommends one frit or a combination of frits, the specific recommendation is based on your individual need. All the facts are carefully weighed—design of the part or product to be enameled, gauge and type of metal to be used, plant processing conditions, end use of the part or product and the particular service conditions to which it will be exposed.

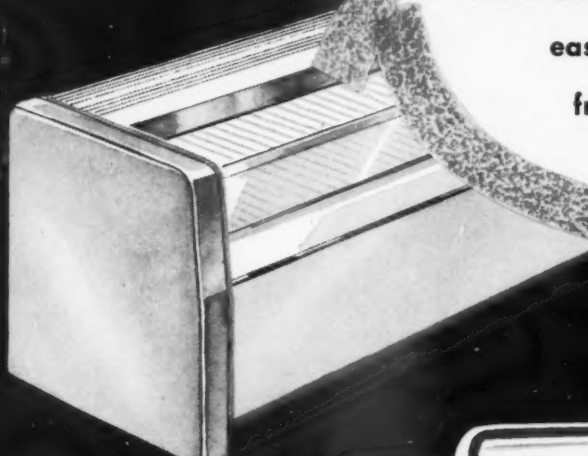
So, when you receive a Chicago Vit recommendation, you can be sure that it is "right" for the job at hand.. No matter what the enameling question may be, Chicago Vit's 35 years of service to the industry will go to work at once to get you the answer you need.

Chicago Vit

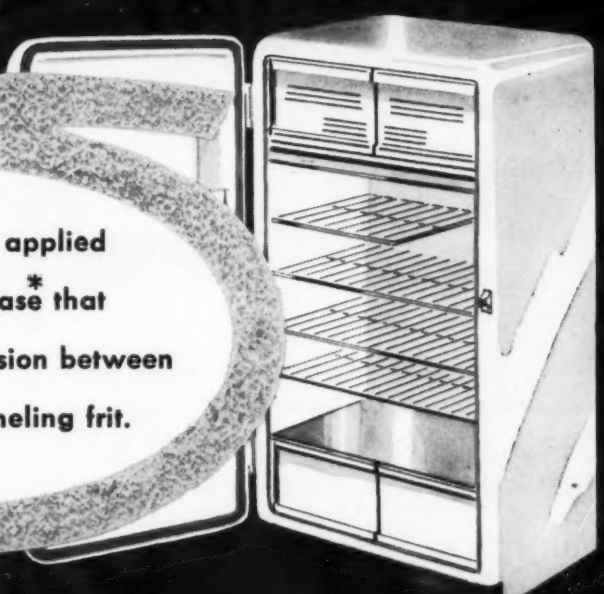
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A good porcelain enamel
finish assures gleaming beauty,
ease of cleaning and freedom
from nicks and scratches...



... Especially when it's applied
on a good enameling base* that
promotes maximum adhesion between
the steel and the enameling frit.

PORCELAIN ENAMEL ON

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

McDANEL

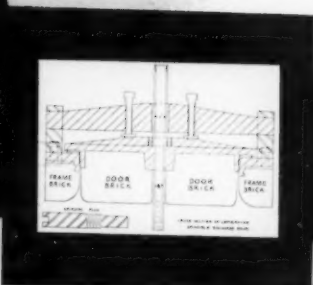
MILL HEAD ASSEMBLY



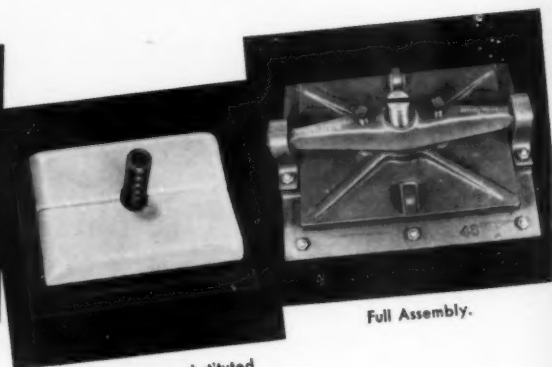
Inside View of door in Place.



Solid Door for Dry Grinding.



Cross Section View.



Discharge Plug substituted for Grinding Plug.

Full Assembly.

CHANGE TO McDANEL Mill Head Assembly

Your old doors can be replaced easily and quickly with the modern McDanel Mill Head Assembly.

Replaces old frame, door, gaskets, bolts, clamps — everything for a complete installation.

McDanel High Density Door Blocks and Frame Bricks are harder and tougher than standard Porcelain. They can be depended upon to give perfect protection around the door where the mill lining is subject to greatest wear and abuse.

Other features include protection against grinding iron off the door and mill frames, the discharge of wet grinds without removing the door, and long, trouble-free life.



McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.



Nu-Matic saves over \$300 monthly on finishing costs and downtime

PROBLEM: Finish faster . . . cut down-time
. . . reduce abrasive costs.

THE ANSWER: Nu-Matic Air-Inflated Grinder. Built like a tubeless tire, it flattens out at point of contact . . . provides up to 3,000% greater abrasive contact area. Coated abrasive rides on a cushion of air . . . shapes to contour of work surface.

RESULTS REPORTED:* Corners of refrigerator doors finished with a 75% savings in coated abrasive consumption—abrasive band changing time cut 80%.

Stainless steel sink welds reduced to a 4B finish in half the time required with a hard wheel—herringbone marks eliminated.

Furnace casing tops finished twice as fast.

Flash removed from aluminum alloy forgings with a 50% saving in labor costs.

Holes in thin panels deburred in 35% less time. Weldments buffed and polished 50% faster.

CUT YOUR COSTS -- AT OUR EXPENSE

Write now for your 25-day test run with a Nu-Matic Air-Inflated Grinder. Use it on your toughest jobs. Compare your costs before and after use. If Nu-Matic isn't worth \$15.00 a day—EVERY DAY—return it for full credit at no obligation. Specify Model 330 (3-1/2" dia. x 3" band width) or Model 535 (5" dia. x 3-1/2" band width).

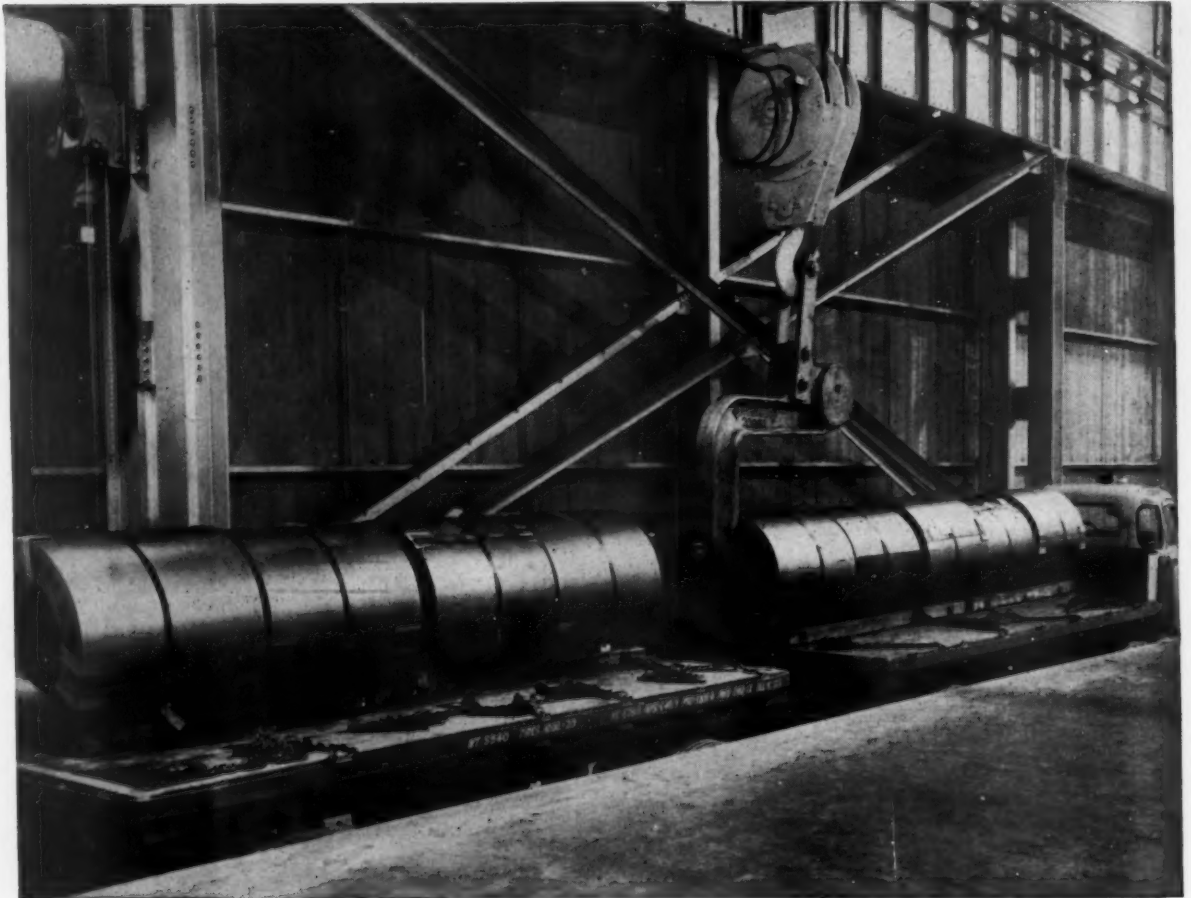
*Names on request

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Ready to supply your requirements for Cold Rolled Sheets and Strip



Cold rolled sheets and strip are being shipped from the new mill at our Indiana Harbor Works at East Chicago, Indiana. This new cold rolled sheet mill, with a monthly capacity of 40,000 tons, is a major unit in an integrated program of additions and improvements.

We are ready to supply your requirements for cold rolled sheets and strip. For further information, write or phone our nearest District Sales Office.

First commercial shipment of cold-reduced sheets ready to leave the mill—January, 1954.

Youngstown



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HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC CATHODE PLATE - RAILROAD TRACK SPIKES

Building short-run products on a seasonal basis

how a Seattle firm produces some 20 models of fountain freezers
to meet a highly seasonal demand

by Howard E. Jackson

THE Sweden Freezer Manufacturing Company, Seattle, Washington, is annually faced with the problem of turning out some 20 models of fountain freezers on a seasonal basis, to get delivery to its national and international distributor-dealers before and during the proper season. The factory accomplishes this by utilizing a variety of equipment, simplifying fabrication and finishing of short, fast runs of needed models. The freezers could not be stored until "another season" for design changes are necessary every season.

The fountain freezers, used for dispensing soft ice cream, are made in floor and table models with single and double heads, automatic continuous, continuous and bath models.

All parts of the fountain freezers—except the motors, compressors, controls and cables—are fabricated in the factory. Many parts, such as top, front, side and back panels, frames and other parts are completely fabricated in the plant. Many parts like cylinders, dashers and so forth are practically all fabricated here—machining and polishing being done to the castings, final forming, punching and polishing being accomplished on other parts.

Fabrication flow

Fabrication flow is from rear to front. Material is stored near shearing section. Shears are equipped so that both front and back gages can be operated from the front.

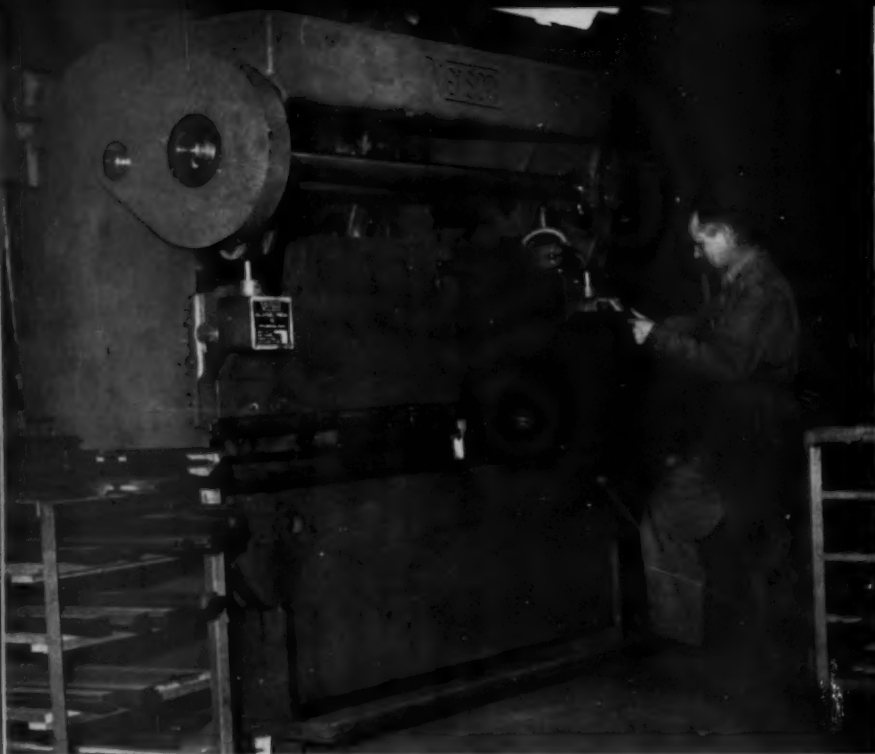
Next comes a deep throat punch press with its own rack of dies. The press is shop-equipped with adjustable back gages. The bar with the gages moves from front to rear, and rear to front, the depth (24 inches) of the throat on steel slides. It can be stopped and set in place at any point without the use of screws.

The adjustable gage bar has four side stops extending from it with numerous disappearing stop pins attached to them. The weight of the sheet material, or part, being fed into the machine pushes down the first forward or side disappearing stop pin, when the sheet or part is fed further back or to the sides. Practically no gages and stops are necessary on the dies themselves.

Right: Shearing side panels from 20 gage cold rolled steel on an 8-foot shear.

Below: Knocking out holes in drip tray. Finger points to side stop which disappears when sheet is shifted to new position.

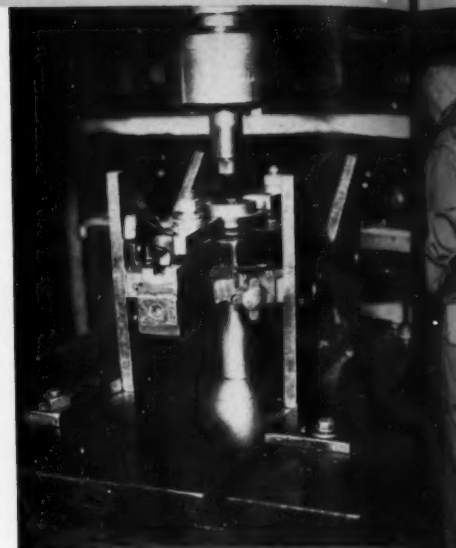




Next in-line machine is a 8-foot press brake. Like the shears, it is equipped so that both front and back gages can be operated from the front. The press brake has its own four wheeled, steel die table-rack which is kept alongside of machine. The dies can be lifted directly into place in the brake. Good utilization of this brake is the hemming of edges of 20 gage cold rolled freezer tops. A brake of 60 degrees is bent in the right die in the machine, then the hem is completed by flattening the bend in a flattening die at the left in the same machine.

The basic engineering of shearing, punching and braking on these machines applies to practically all the parts made in this sheet metal section . . . the sides, back panels, the inner liners, the top "wrap around", etc. Here problems have been solved by versatility of die-set-ups and completing as many operations as possible with one die.

The machine shop also is equipped with the latest turret lathe, mill and other machines for making the six types of freezer fronts from special dairy metal bronze rough castings, some high nickel bronze dashers from



Left: Hemming the edges of steel freezer tops. Here a 60 degree bend is made.

Above: Turning second half of gear case on a drill press, an operation usually performed in a lathe.

rough castings (winding the spirals in an engine lathe) and turning out the scraper blades and gear cases.

Detailed operations in gear case production

One of the details of interest here is the making of the gear cases. Each case is composed of two halves, purchased as rough castings, with one face of each half machined. The machinist's problem is to match up a number of holes in each of the two halves making up one gear case, so that the common shaft and bearings will line up.

Welding legs to top and bottom of freezer frame. Definite sequence is followed to get the frame within 1/8" of square.



Welding tubes from expansion valve to heat exchanger on final assembly of automatic continuous fountain freezer.





Polishing red bronze fountain freezer fronts — here appearance is important. Special tote boxes are used to facilitate handling the freezer fronts to and from polishing.



Spraying white baking enamel on face side of small panel. After 15 minutes "set up" time on the racks, the panels are baked in an electric oven for 15 minutes at 320° F.

A special gear case jig was made with two faces, one for one half of the case and the opposite face for the second half of the case. One half of the gear case is placed on the loading jig, with the faced part down, and clamped to the fixture (no wrenches). The jig is then turned over and put in a drill press. Using a quick change chuck, 8 holes (face holes) are drilled in that position. (Six of the holes are drilled; two are drilled and reamed).

The fixture is then turned on its side and 2 holes drilled. It is then turned on its face again and two lo-

cating pins put in dowel holes, to hold the case half in position for the following operations in an adjoining drill press: two bearing holes are bored in one pass, the tool removed and the holes finished reamed, and then the oil seal hole is bored and reamed (secondary hole below bearing hole).

That completes the drilling of the first half. (Lots of many hundred are drilled at a time). Then the drilled half is removed from the jig, and the fixture turned over. The second half of the gear case is then laid on the second face of the fixture, with the

faced part of the gear case down, as before. The clamps have meanwhile been removed from the side to hold the second half of the gear case in position.

The same steps as described above are repeated in the two drill presses. The same holes are used, so that the two halves must match. All drills used are available in proper sequence along the rear of the respective drill press.

On the second half of the gear case a turning operation is accomplished in addition to the drilling done on the first half. This is done in the

Applying fiber glass insulation on inside of side panels, using a special cement. A sound deadener covers the inside top panel.



Applying a Sweden Speed Freezer decal on an exterior panel, using a template to center the decal.



second drill press. It is work usually done in a lathe—the part faced, turned and faced, by a special tool.

Motorizing hand operated press equipment

Where hand machines are used in this factory for fabricating they have been motorized. An example is a hand-operated 20-ton power press converted into a motorized press. The press is used for cutting out center holes and forming up lips around the holes on storage mix tanks (for the ice cream mix), and freezing cylinders (where mix is converted to ice cream). The cylinders are 8 inches wide, and deep drawn 24 inches. Both are stainless steel.

The shop men motorized the machine by means of installing a $\frac{1}{2}$ h.p. motor and a fountain freezer gear head on the top of the machine, with a hydraulic pump along the upper front of the press. Cutting and forming is simple and fast with this motorized machine.

Welding procedure

Welding plays a prominent part in the fabrication of the fountain freezers, as many of the component parts must be leakproof and some of them are pressure-tested after welding. These parts include the liquid receivers, heat exchangers and the freezing cylinders (with refrigerant sleeve). Here, jigs and fixture and short-cut procedure cut production time. The 3/16 inch angle iron frames are a good example. They must not be more than 1/8 inch from square when cut, notched, bent and welded to their square shape. The jigs are made square, so that the 90 degree corners assures the welder that the frames will be squarely welded. A definite sequence of welding is followed, using a 225 amp., a.c. machine. As the top and bottom are clamped upright, with the first two legs between them, welding is all one way . . . front leg at the bottom, down to back leg at bottom, to back leg at top, to front leg at top. Each time the welders turn a frame 90 or 180 degrees they weld in the opposite direction to the previous time. If they do not follow this sequence

the frame will warp out of square.

Welders have an extra consideration in much of the silver soldering work as many welded items are later polished. An example is the welding of the bushings in one end of the dasher. The object is to get to use the least amount of solder necessary to do the job, otherwise there will be too much polishing.

The polishing department

The inner radius, the outer radius in the bottom of the freezing cylinders, and the walls themselves are sanded with a flexible shaft, equipped with 60 to 100 grit sandpaper.

The polishing department comprises a separate large room, equipped with five polishing lathes and an assortment of other machines, some shop-made. Raw materials, castings, flat stock, circular stock, sheet metal and formed parts are polished here to any desired finish . . . bright, satin, two tone, two color, etc.

The polishers do contour shaping, internal grinding and finishing (as on the panels), trim all solder and welds on general purpose machines equipped with short and long shafts, and also trim by hand. They deburr, do some lapping, buff, remove mold imperfections, do plastic polishing and fit the dashers to the freezing cylinders. Emery wheel grits vary from 36 to 320. They also use mastic aluminum oxide compounds, one heavy in animal fat, one heavy in grit. They polish white and red bronze, aluminum and stainless steel.

To speed up production, special tote boxes were made for holding the machined castings during machine shop work and polishing. The freezer fronts are an example. The boxes are interchangeable for the types of fronts, one front fitting over pegs in the bottoms of the tote boxes, and the second front sliding over blocks fitted to the bottoms of the boxes.

The outstanding feature of this polishing department is its flexibility; it handles any phase of polishing, with a half dozen jobs running concurrently. Angle irons for frame motor armatures are deburred on one machine; 4-quart dashers have their scale removed, preparatory to finish-

ing, on a shop-made machine that does all inside tickling machine work (where there is danger of getting the dasher caught in the wheel); freezer fronts, scraper blades, drip trays, covers, valves, armatures, mix tank covers, and other parts are polished on the larger lathes.

Close tolerance work is required, such as in shaping the dashers, and grinding, shaping, aligning and fitting the scraper blades. Appearance is required too! Polishers resort to old jewelry polishing tricks applied to industrial work, to get two and three color work. Fountain freezers are generally placed where the public can see them . . . so their appearance is important.

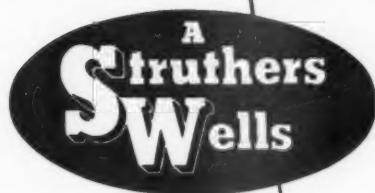
Polishing completes the finishing on many of the parts: the stainless steel tops, fronts, "wrap arounds", gates, drip trays, etc., and such like. The rest of the finishing takes place in the paint department. Most of the cold rolled steel sides and backs are spray painted with synthetic white baking enamel, but some machines get different paint jobs. For example, the panels on machines slated for the motion picture theatre trade are painted black. The company will custom-finish any freezer, and has painted some in green, ivory and oriental red.

Painting and sound deadening

After cleaning, all panels get a fog coat on the reverse side, using white baking enamel as a rust inhibitor. Four swipes are made, with 70-lbs. gun pressure, with gravity feed. The panels to be painted black get a special spray primer. The panels dry on special-built racks and then are given two coats of the same enamel, same pressure, on their face and edges. After 15 minutes "set up" time they are baked in an electric oven for 15 minutes at 320° F. (white panels). Baking time for black enameled panels is 30 minutes at 200° F. (to minimize loss of lustre).

All the side panels are covered with fiber glass, and the top with a material designed to deaden the sound of the motor and compressor, as well as for insulating purposes. Sweden Speed Freezer decals are then applied

to Page 34 →



Production Package

For Efficient, Economical Appliance Cabinet Manufacture



Punching and Notching Machine

The new Struthers Wells Punching and Notching Machine delivers maximum utility in pre-forming sheet metal wrap-arounds for refrigerators, freezers, washers, dryers, etc. A specialized cross between press and press brake, this machine mounts punching and notching die sets for precision sheet processing prior to roll-forming, and permits rapid changeover to flanging dies as desired. Capacity of the Struthers Wells Punching and Notching Machine illustrated is 150 tons, handling sheets up to 4 feet wide and 18 feet long.

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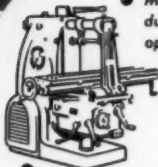
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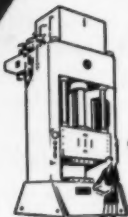
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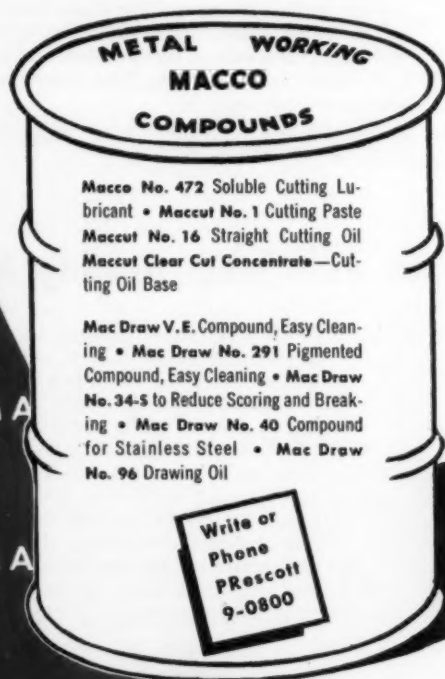


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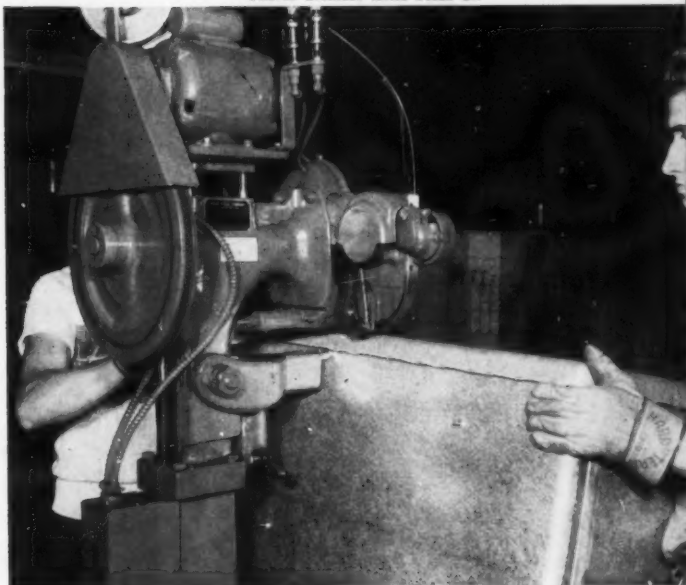
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Photo on left shows top section being stitched to wall section of aluminum freezer interior unit. Hand clamps have been used to hold the top and wall sections together prior to stitching. The photo below shows a close-up of stitching operation.

PHOTOS COURTESY ACME STEEL CO.



Metal stitching freezer liners

how Jordan Refrigerator solved a bottleneck in the production of aluminum interiors for upright freezers

METAL stitching — a method of joining thin gauge metal to metal, and metal to other materials — has helped solve a production bottleneck at Jordan Refrigerator Company, Philadelphia.

This manufacturer of upright food freezers stitches top and bottom sections to wall sections to form the interior units for the freezers.

When assembling, the top and bottom sections, both made of .054 aluminum, are first positioned and held to the wall section with hand clamps. Sections are then joined, using corrosion-resistant galvanized stitching wire.

Production increased 5½ times

Originally, spot welding was used, but did not prove practical for this particular job. Moreover, the aluminum sections had to be placed in

jigs for the welding operation and the welded interiors required close inspection — both time-consuming jobs.

With metal stitching, the same number of workers are now able to complete 5 1/3 times the number of units formerly produced, stated Leon

Priole, foreman. In addition, good quality control is obtained because a defective stitch is easily noticed.

Minimum maintenance, ease of operation, and savings in material costs are other important factors realized by Jordan Refrigerator in the use of metal stitching equipment.

Leon Priole, foreman at Jordan Refrigerator, inspects a stitched interior for an upright freezer.



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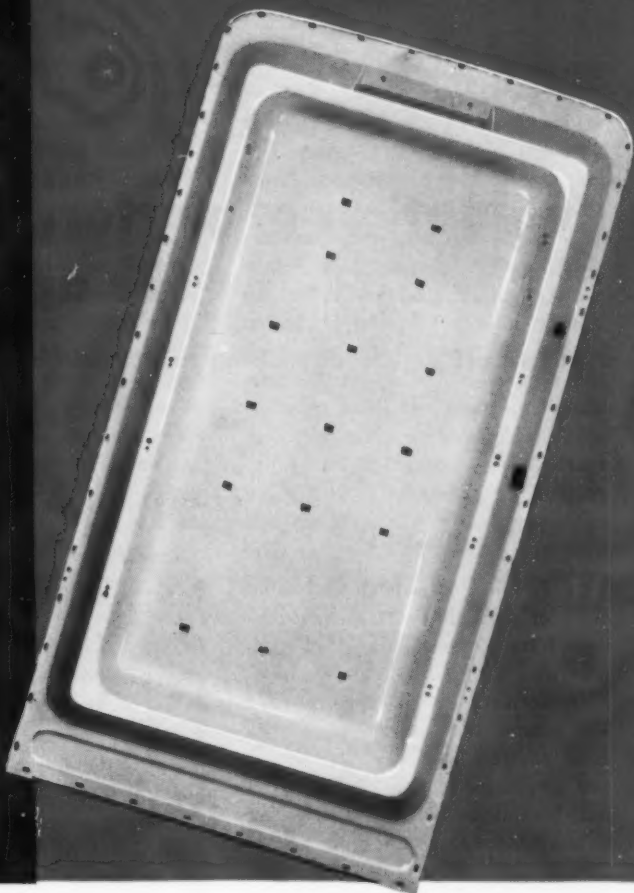
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Evaluation of performance for appliance controls

a three-part article describing techniques and devices for testing control components

PART I

by *George C. Pearce* • RANGE ENGINEERING SECTION HEAD, FRIGIDAIRE DIVISION,
GENERAL MOTORS CORPORATION, DAYTON, OHIO

WE WILL present an evaluation of appliance controls performance from the viewpoint of an engineer who is responsible for the overall performance of an appliance. We will assume that the appliance contains controls, and that the details and specifications have been worked out. We want to discuss special testing techniques for determining the endurance of the controls, why these tests are needed, and how they are developed.

Controls have always been a very important part of appliances, and the trend is toward even more elaborate control systems. The devices which have been displaced by up-to-date appliances had primitive controls, or none whatever, which did give them an advantage in reliability. Many modern appliances are completely out of service if the controls fail. Our ambition should be to equal, control-wise, the service-free operation of those earlier devices.

Purchasers are reminded of their experience during 1941-45 when many controls, or complete appliances, were out of action for long periods of time, due to a lack of parts and repairmen. For this reason, plus the increasing cost of service labor and material, consumers should expect the utmost efforts from appliance manufacturers to produce controls designed and tested to last the life of the product.

In addition to the reputation of the product, the manufacturer also has a big financial interest in control

service. Reserves for service in warranty must be based on past performance. If this is constantly improved, the financial results are bound to be good.

The importance of component reliability to the industry has been recognized in some cases by the adoption of testing standards. I can recall NEMA and ASA standards for life testing surface units, thermostats and switches for heating appliances; the ASTM Committee B-4 on contact materials; and NEMA cooperation in improving pilot light life.

Unfortunately, most of the testing methods and machines, similar to the

few we will describe, have been created and used by individual manufacturers many times as a result of an unhappy service experience.

In this series of articles we will discuss test techniques and devices developed and used at Frigidaire in our constant search for more reliable appliance control components. We regard these tests very highly, and have invested a considerable amount of money through the years, bringing them to their present state, and we use them constantly.

For the first example, take the case of range timers, which are also typical of stoker timers, defroster timers,

FIGURE 1

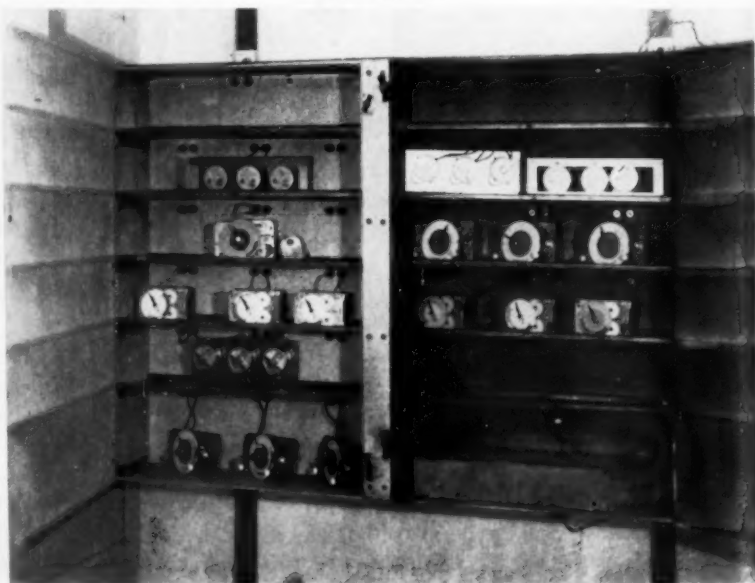




FIGURE 2

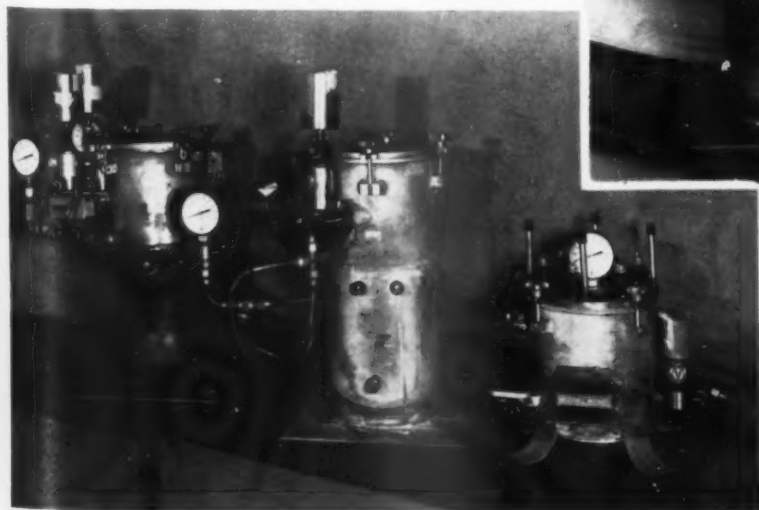
washer timers, etc. The defroster and range timers operate all the time. In addition, the range has a variable ambient temperature through fairly wide limits. We started on it in 1944, and our "post war" objective was a timer good for 10 years average life, without service. The manufacture of new timer parts was forbidden at the time, so we had plenty of failed units sent in for salvaging parts. Examination of these disclosed motor failure responsible for over 90% of returns. Further examination of several hundred motors showed open circuited coils caused about one-third of stoppages, lubrication failure caused the remainder. Since we do not manufacture motors, we took the problem to our suppliers. They succeeded in reducing open circuits by design changes to stop corrosion of the fine

wire at terminals, better dielectric to ground, and better mechanical support of leads and terminals.

We decided to do some motor testing ourselves, and, with 10 years life in mind, we naturally tried to dream up an accelerated test. We have not been too successful in this. We built a simple test cabinet (Figure 1) in 1944, and have used it constantly ever since. The right side ambient temperature varies from room to 165°F. on a two-hour cycle. This is to accelerate evaporation, varnish formation and corrosion in the oil, also to produce a pumping or breathing action in the oil reservoir. The left cabinet operates at room temperature. Once a week both sides are shut down and allowed to cool completely. Sample batches of motors are divided between the cabinets. Failure is positive if the motor will not start or synchronize after the shut-down. In some cases, the end of life is set by excessive noise, even though the motor is still running. We found the habit of weekly shut-down shortened the test life by several months. This feature and the temperature range are the only accelerating devices we have.

FIGURE 3 →

FIGURE 3-A ↓



We are constantly testing not only timers used currently on our product, but practically all makes available that we might use. The long duration of the test makes this imperative. Knowing that the motor manufacturers have similar test programs on a much larger scale, it is natural to ask why we have spent money on this project for 10 years, when we neither make nor sell the motors. We have an independent check on motor life under conditions of our choosing, and an excellent idea of the relative motor performances for use in future products. We have also determined that a constant increase of motor life, under described conditions, has been accompanied by a corresponding decrease in servicing on our products.

We are beginning to see a ratio between our cabinet life and average service life. We keep our sources informed of performance of their samples, along with hints that longer motor life is still our objective, and a desirable thing for the appliance industry. This test has not cost much for equipment, but our file on small synchronous motors represents several thousands of dollars in testing time alone.

The household refrigerator is an appliance which operates constantly. For a life expectancy of 10 years, the controls must demonstrate ability to operate hundreds of thousands of cycles. Accelerated tests are a "must" for their controls. The thermostat offered problems. We used to alternately dip them

into cold and warm wells, but this required a great deal of equipment and maintenance. The cold well would "ice up", the alcohol would evaporate, or be diluted with water, and the test was still too slow.

One practice — dating back to low pressure controls — is to cycle the switch with air in the bellows system. The pressure is raised and lowered at any desired rate by using a reservoir and orifices for incoming and

outgoing air. The tank pressure range is controlled by a master switch. Any number of switches can be connected to the tank, running either loaded or not. A typical set-up of this type is shown in **Figure 2**.

This is a destructive test because the charge has to be dumped from the bellows system. The switch operating pressures are read periodically by cutting a gauge into the tank, or by removing the samples to a pressure test board.

To run a similar endurance test with a complete switch, the test device, shown in **Figure 3**, was developed. Several switches are placed in a "bomb" which is sealed. Since the action of a bellows depends on the

difference between internal and external pressure only, and internal pressure is fixed by the charged pressure of the bellows system, the thermostat can be made to cycle normally by varying the pressure in the bomb. This is again done with a master pressure switch, solenoids and orifices. Leads for loading contacts, or, in this case, pilot lights to indicate operation of each sample, are brought out of the bomb through conventional compressor seals. Samples can be checked by removal to a cold well, or, roughly, by reducing pressures in the bomb. This is a very fast and handy test set-up. Several bombs used at different pressures are shown in **Figure 3-A**.

Building short-run products on a seasonal basis

(Continued from Page 26)

to the panels, centering them with a template.

The steel frames are painted with aluminum etch lacquer thinned 2 to 1, and sprayed on one coat using 35 lbs. gun pressure. The outside shell of the freezing cylinder, solenoid bracket, condensing unit cradle, gear case bracket, wire box, cooling pan,

drip pan and heat exchanger are all painted the same as the steel frames. The heat exchanger and other internal surfaces of the refrigeration system are cleaned by sandblasting.

The liquid receivers are first treated with an acid solution as a rust preventative (and washed with lacquer thinner, too). When gear cases

are received as rough castings they have a rust inhibitor on them. Both liquid receivers and gear cases are painted with one coat of black lacquer, thinned 50-50, and sprayed on at 55 lbs. pressure. These parts are lined up on the long benches, 150 in a row.

A special hot lacquer thinner is used so that the paint will dry immediately, eliminating "Japan" dryer, or "waiting" for air drying. By the time the painter reaches a row end, he can go back to the beginning of the row and flip over the parts to be painted on the opposite side. By production-line methods, a liquid receiver can be painted in 1 minute, heat exchanger in 2½ minutes and gear case in 4 minutes (2 minutes each side). Handling time is nil.

Finished parts are taken by hand cart to the store room, sub or final assembly as needed. All fountain freezers must be carefully assembled and check tested. They are lined up and each machine must "make" milk shakes and ice cream before it is given the final okay. Each machine also gets a thorough inspection appearance-wise before it is crated and shipped.



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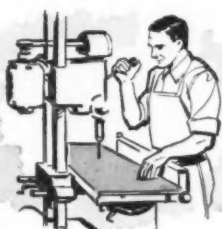
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Heintz solves a "burning problem" with heat-resistant gloves

A SPECIAL type of glove, made from a thick twisted loop pile fabric — which is akin to turkish toweling — have helped solve several production problems at Heintz Manufacturing Co., Philadelphia.

Use in fabrication department

In one case, workmen were receiving minor burns through gloves while handling formed metal parts. While the burns were not serious enough to be classified as time-lost injuries, they were reducing press-shop efficiency.

Since canvas gloves did not prevent the burns, Heintz tried asbestos gloves. They reduced injuries, but would not stand up under rough usage. Glove replacement costs soared.

So the company turned to a different type of glove which features thousands of tiny air cells which insulate against both heat and cold.

Tests soon showed that the new heat-resisting gloves would prevent burns in most of the operations, and that, with extra heat-resisting lining, they would take care of extreme cases such as handling parts from the cold extrusion press, where intense heat is generated.

Use in enameling department

Heintz also found that the gloves solved an annoying problem in its porcelain enameling plant. The gloves formerly used frequently left lint on the enameled parts. Loop pile fabric gloves did not.

Processing from 1000 to 1500 tons

Inspectors at Heintz are shown handling enameled washing machine parts with the special gloves which leave no lint on the surface.



Work gloves, made from twisted loop fabric, are used at Heintz to handle sharp-edged fabricated parts.

of steel per week, Heintz protects some 3800 factory employees from hand, finger and forearm injuries.

More than a dozen different types of gloves are purchased, in addition to finger guards, hand pads, and arm guards. Each job analysis designates the safety requirement for the job, including hand and forearm protection.

It is pointed out that the use of the new gloves at the Heintz plant illustrates the versatility of these gloves in solving hand protection problems.

Another property of the glove is the ability of the fabric to resist wear and cutting. Another is the reversible construction, which permits the glove to be worn on either hand.

The ability of the gloves to withstand repeated cleaning contributes to longer glove life and lowers glove cost. Usually, they can be reconditioned three or four times. The reversible construction of the gloves helps simplify cleaning. Any two gloves make a pair; therefore, no time is wasted in matching up right and left hand gloves.

The twisted loop pile construction of the fabric acts as a cushion and gives the gloves superior resistance to the cutting action of sharp-edged materials. The construction of the fabric also afford a better grip when handling slippery objects.

Source for more information on these gloves may be obtained by writing to finish.

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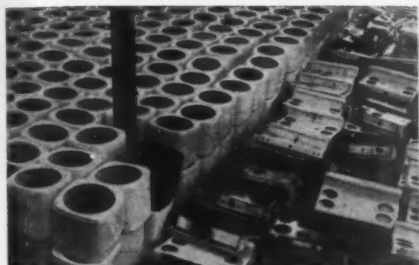
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During the past three years D-Enameling has made it possible for appliance manufacturers to transform scrap loss into profit dollars. As a result, D-Enameling has become a permanent part of the appliance manufacturing picture among plants whose management is seeking every possible means of effective cost control.

So, if you're interested in cost reduction (and who in management isn't), it will pay you to learn all the facts about D-Enameling. Let us give them to you soon, won't you? In the meantime if you'd like to see some D-Enameling results for yourself, send us 3 or 4 samples of the part you are particularly interested in. We'll D-Enamel them at our expense. Then you be the judge.

New Process *D-Enameling* Corp.

Highland and New Haven Avenues • Aurora, Illinois



Architectural porcelain enamel fronts huge shopping center

by Walter Rudolph

BEAUTY, permanency and ease of maintenance are some of the features boasted for architectural porcelain enamel fronts on some 20 units of Erie, Pa.'s, huge new shopping center, Commodore Perry Plaza. This is one of the largest installations of its type in the country.

Basic design of the center, and specifications that included porcelain enamel, were drawn up by Jules Schwartz & Associates, Cleveland. Interest in this type of facing is strong in the tri-state area surrounding Erie. But of course there was a "selling job" done by Erie Enameling Co., a firm offering complete architectural porcelain enamel service since 1921.

"We have worked some with Emil Mueller, who is back of many shopping centers scattered throughout the area, from Rochester, N.Y., westward," reported R. W. Brownfield, sales manager at Erie Enameling. "Backers of Commodore Perry Plaza talked with Mueller and other build-

ers in Ohio cities, and through one of the local men we learned of their interest and we followed up to get the job."

One of the Cleveland contractors favoring this type of porcelain enamel application is Anthony Visconsi. Erie Enameling was somewhat handicapped in relation to production of the various panels going into the vast job, because many of the details of the blueprints were disregarded when actual construction went for-

ward. Even so, engineering and fabrication and enameling worked closely and swiftly as fronts were called for, and no phase of the comparatively fast construction was held up for lack of enameled pieces.

More adherence to drawings would have made more of a "straight run" job out of prefabrication and enameling, but as it worked out, various units or stores of the shopping center were jobbed through the plant at unrelated times. Upwards of 6,000

R. W. Brownfield, of Erie Enameling, looks over panels ready to go to the job site for one of the unit stores. All panels were checked against master control panel.



Left: An overall view of the Commodore Perry Plaza, Erie, Pa.'s new shopping center, which features a complete porcelain enamel frontage for some 20 units.

Right: View of another aspect of installation job—with coping not quite finished. Letters were fastened with through bolts, and panels under letters were blocked up to stand tightening to letters.



square feet of porcelain enameled steel went into the complete center, with 16 gauge enameling iron used throughout.

The largest single lot, or number of similar pieces, went into the building's coping, or top panel on the top parapet of the structure—when finished it totaled 680', three inches wide. Perhaps the outstanding work, at least to the layman, could be the center's tower, completely faced with porcelain enamel. This steel and wood structure begins 18' above ground level, on the building's roof, and runs 42' above the roof, with 4 x 6' sides. It is topped by a flashing beacon.

When it was finished off with sheeting on all sides, the steel-wood tower was basically "out of true" so much, that it was decided to make porcelain

enamel panels to standard sizes and build up the tower surfaces before application, rather than try and make all special sizes to fit.

Attachment methods

Ordinary application of the porcelain enamel panels followed closely the fastening details given here:

Impregnated 1 x 3" wood furring was erected vertically and horizontally, plumb and level, on the structure's surface. Erie Enameling sent job lots to the site with stainless steel "L" lugs welded three inches from the right edge, and six inches from the left edge on each side of a panel. Lugs on two adjacent sides were placed under previously fastened panels, and the lugs on remaining two sides were applied to furring with aluminum wood screws.

Blind fastening was then done in joints through holes in lugs on two adjacent sides which were placed under previously fastened panels. Panel joints run from one-eighth to one-quarter inch, and were thoroughly caulked.

Areas to be covered were broken up with two things in mind: for appearance's sake, and panel sizes that would eliminate warpage. One of the difficulties surmounted was that of the tower's color scheme, including stripes of corner or edge coloring. Three operations (manual) were saved in shop work by making separate 6 x 6" corner pieces, rather than making two-color panels of greater area.

Some store paneling was chamfered, with 1/4" flange, and 5/8 x 1" chamfer. Special wood blocking was placed behind panels where letters were to be fastened for unit names; through bolts hold lettering. Neon tubing installers made templates to size for each customer using neon, and the fabricator drilled holes for such installations from the templates, after fabrication and before enameling.

Color matching

Colors were greatly varied, but didn't pose too much of a problem. Matchings were made with paint, marble, and competitive enamel work (such as on chain store's samples from another out-of-town installation). Samples were mixed, sent through the laboratory, and submitted for approval. When engineering completed the square footage for a unit job, the figure was given to control engineering to compute the amount of enamel of a color needed, and about 10% over that amount (for repairs, etc.) was included in the batch.

Erie Enameling doesn't use color names, seeking to avoid confusion through color code numbers. All colors were stippled except for two units. When a unit's panels were ready to go to the job site, pieces were laid out in the warehouse adjacent to the plant, and the master control panel (which goes into a permanent file) matched to others. This allowed color comparison or matching, and a check on the correct size and shape for each piece.



Close-up showing installation of panels on one unit. Sizes were varied for appearance and installation considerations.



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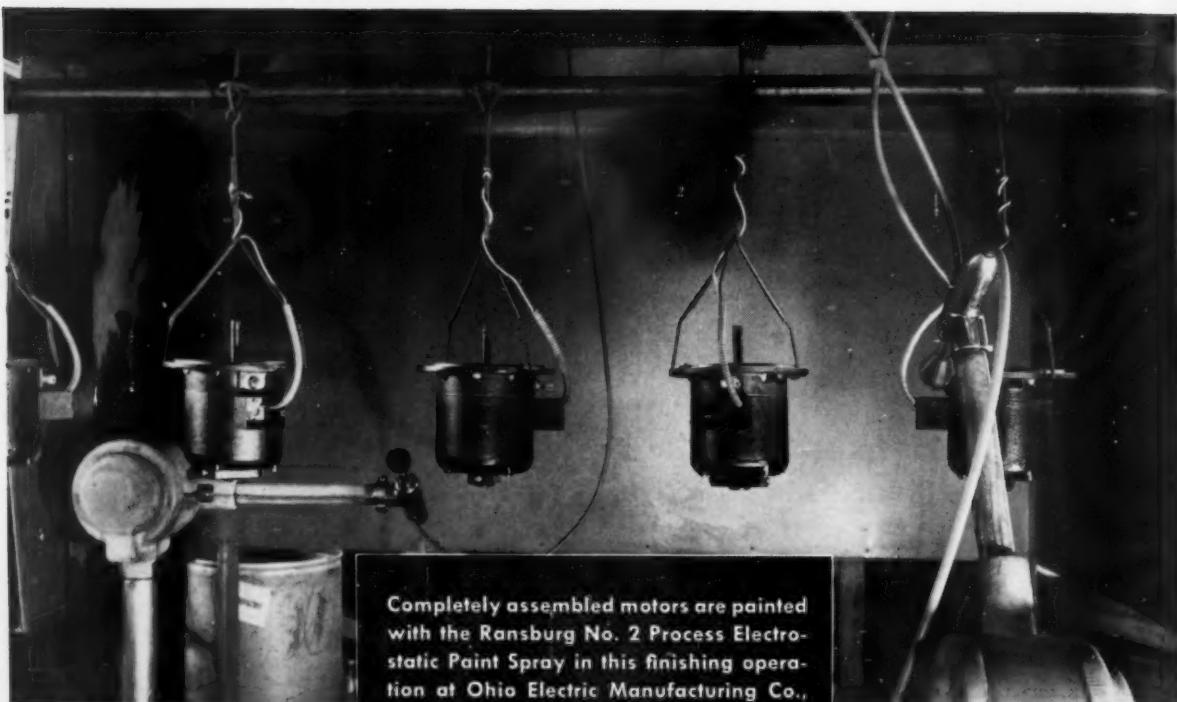
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Completely assembled motors are painted with the Ransburg No. 2 Process Electrostatic Paint Spray in this finishing operation at Ohio Electric Manufacturing Co., Cleveland, Ohio.



Here's an Unique Application of the RANSBURG No. 2 PROCESS

● Both in this country, and in foreign countries as well, the Ransburg No. 2 Process is being used by a variety of manufacturers for painting a widely varied line of products.

One of the most unusual applications of the No. 2 Process is that at Ohio Electric Manufacturing Co., Cleveland, Ohio, where completely assembled motors are painted automatically with the electrostatic paint spray.

Formerly, the motor frames, covers and terminal boxes were hand sprayed before assembly. Now, with the unmatched efficiencies of the No. 2 Process, the complete units are coated automatically with a

black wrinkle enamel. As for paint mileage, they paint about 100 units an hour and use about 5 gallons of paint in an eight-hour shift. They're getting a higher quality, more uniform finish, and eliminate the paint runs which used to bother them with the former hand spray method.

See what Ransburg Electrostatic Processes will do for you in your plant. Complete facilities for test-painting YOUR products under simulated production conditions are available in Ransburg laboratories. Write for case history data on products in your field, or send for our sound and color movie, "Miracles in Painting."

Ransburg **ELECTRO-COATING CORP.**
Indianapolis 7, Indiana

RANSBURG

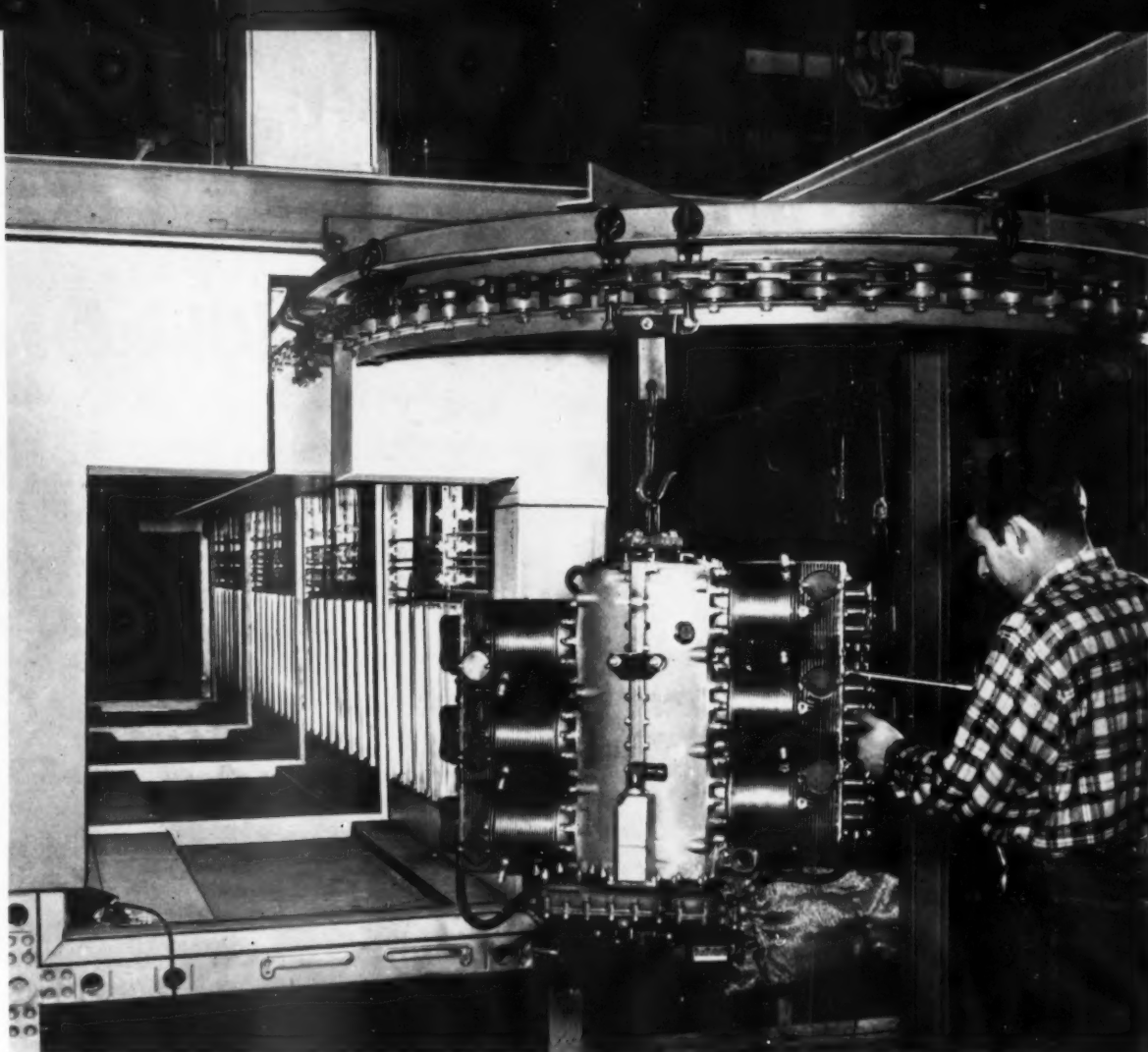


PHOTO COURTESY JENSEN SPECIALTIES, INC.

Baking aircraft engine finish —after assembly

COMpletely assembled aircraft engines are being heat processed after finishing — without damage to the magnetos, wiring, gaskets, and other vulnerable components — at Aircooled Motors, Inc., Rochester, N.Y. Enamel baking is done in 28-foot, 100 k.w. electric oven. Conveyor, designed by oven manufacturer, operates at a speed of one foot per minute.

The manufacturer attributes this feat to its recently installed oven — an electric type that combines radiation and convection. The temper-

ature required to bake the paint finish is reached before even the oil in the crankcase becomes warm. Complete protection for the magnetos is assured by an asbestos shield, designed by the oven manufacturer. Wiring is of neoprene.

The ability to process assembled motors has enabled Aircooled to step up production significantly. Previously it had used a portable lamp oven and batch-type processing methods. Production was slow and often erratic.

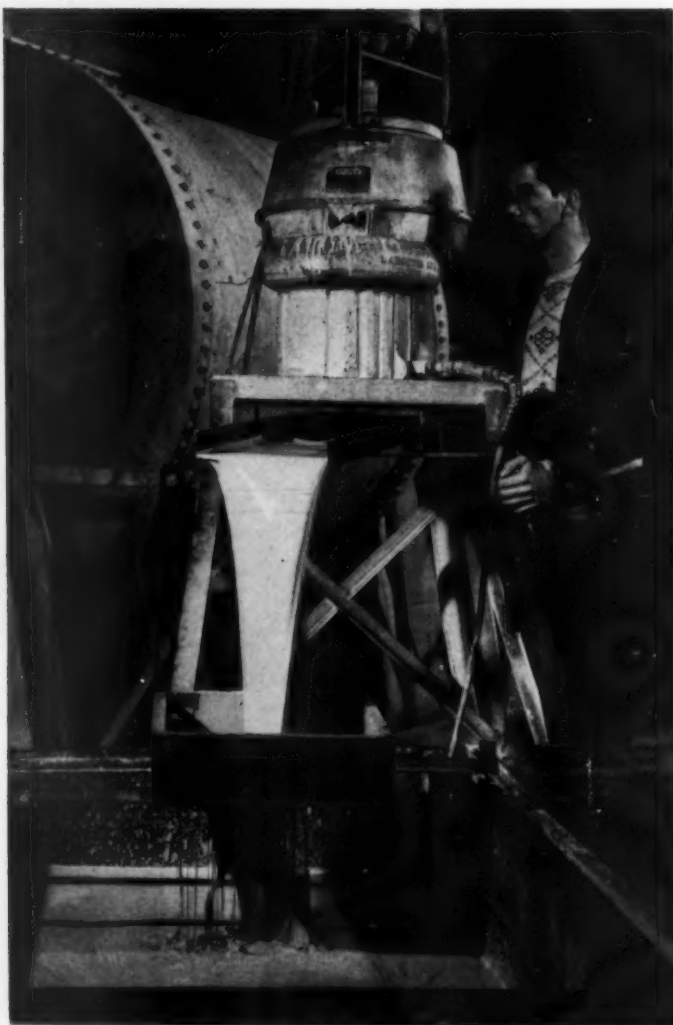
The company also reports that the quality of its finishes is much higher

since the new oven has been installed, and that drying time has been decreased.

"We're getting unquestioned top quality now — thanks to our electric oven", an Aircooled spokesman said. "Our engines are now coming out with superior quality finishes . . . in addition, drying time has been substantially reduced."

Another feature of this installation is that the master control panel is located above the oven on a structural framework. Valuable floor space has thus been saved.

Rotospraying . . . at Whirlpool



Yes . . . Rotospraying is the accepted method of sieving enamel slip at the Clyde Porcelain Steel Div. of the Whirlpool Corporation. Rotospraying assists in the proper cleaning of milled enamel to insure against contamination, and to help in the production of Whirlpool washing machines.

And throughout the enameling industry hundreds of Rotosprays are on guard for the proper cleaning of milled enamel and to help in the production of the finest quality enamel finishes for washing machines, ranges, refrigerators, sinks, bathtubs — in fact for all types of enameled products.

Check you plant today and make sure that you have the correct number and correct size of Rotospray units to properly prepare your enamel slip at lowest possible cost. Then check with us or with any authorized representative.

◆ Photo shows Rotospray in operation in the Clyde Porcelain Steel Div. of Whirlpool Corp., Clyde, Ohio.

Contact us direct or one of our authorized representatives.

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Announcing...

New High Density Mill Lining by Coors

Outstanding Engineering Features Include:

- Double Size Shell Brick
- New Radial Head Brick Design
- Integral Lifter Bars
- Made of Service Tested Ceramic Used in Manufacture of Coors Grinding Media
- Brick Made to Size for Easier, Cheaper Installation.

Coors Porcelain Company has just announced the availability of their new High Density Mill Lining Brick which has been under development and test since mid-1949. This new product, made of the same high density alumina ceramic that is used for the production of Coors Grinding Balls and Natural Shape Media, incorporates several desirable engineering features which will result in lengthening substantially the useful service life of a mill lining.

These include double size shell brick and oversize head brick of a new radial design, which permit the use of about one-half the number of cemented joints required when conventional sized liner brick are laid up, and an integral lifter bar design for use with 1½" thick linings to speed grinding operations. Also, accurate sizes make installation of these brick easier and cheaper.

The accompanying illustrations show these features which are described in detail as follows:

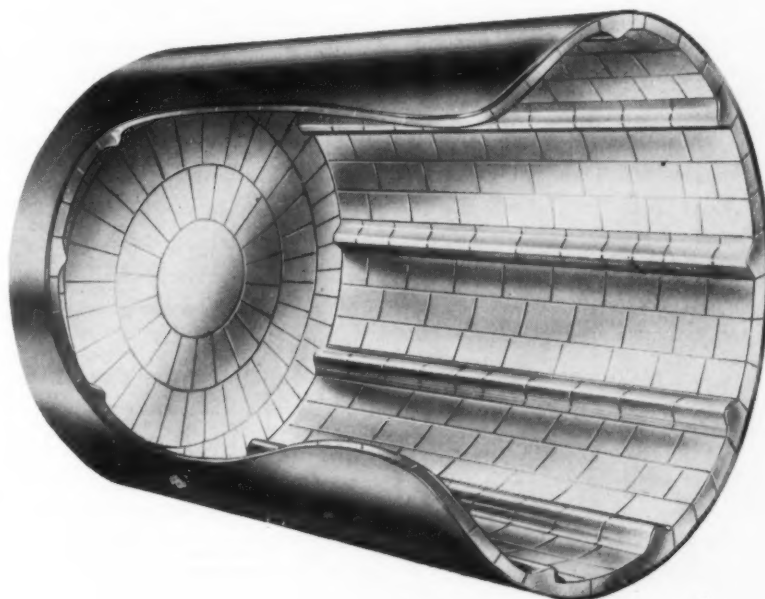
(a) **Radial Brick** in large sizes were developed for use in lining the

mill heads. This is a completely new design which greatly reduces the number of cement joints needed when installing the brick and also eliminates all corners that normally are left to be filled in when rectangular brick are used for head linings.

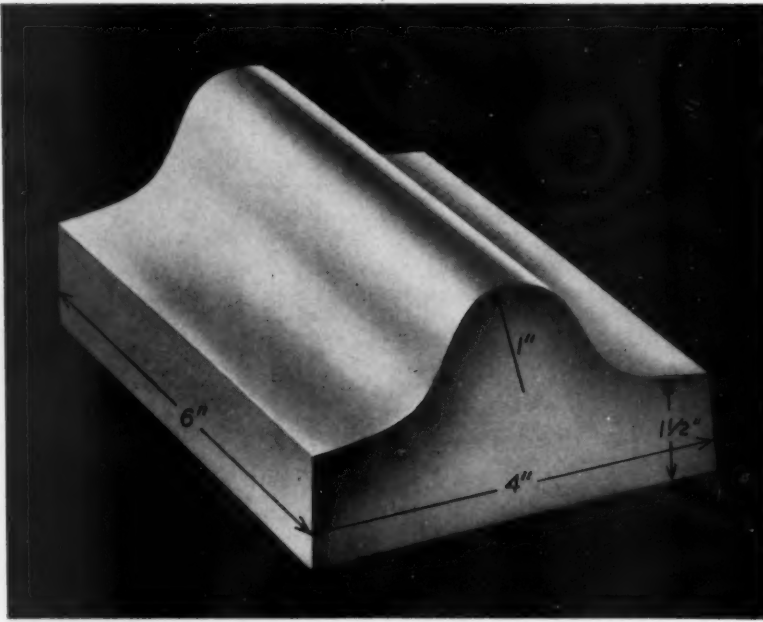
The center of the mill head, as

shown in the illustration is a 12" diameter disc shaped brick around which the radial brick are laid on concentric rows or courses. These radial brick are approximately 3½" wide x 6" long (radially) and, thus, are almost twice the size of conventional liner brick. Also, the radial brick are made in the 3" length for use as fill in brick when lining the heads of 30", 42", 54", etc. diameter mills. The sides or edges of all radial brick are tapered to coincide with a radius of the mill.

When lining the heads of mills that have diameters, 2', 3', 4', 5', or 6', for example, the required brick would include the 12" diameter center disc plus one, two, three, four or



The unique design features of Coors mill linings, described above, are shown here. Note the radial head bricks and lifter bar designs.



Coors Standard 1 1/2" shell brick with integral lifter bar.

five courses, respectively, of 6" long radial brick. For mills of intermediate diameters, such as 30", 42", 54", etc., the combination of brick would include one outer course of the 3" long radial brick mentioned above.

When the door of the mill is too small to permit passage of the 12" diameter disc into the mill, the disc is cut along a diameter and installed in two pieces.

An interesting side product of this head brick design is that it permits use of the 12" center disc as a sort of bullseye to determine easily the exact level of the grinding ball or batch charge in the mill.

(b) **Double width rectangular shell brick** have been perfected also for use in lining the cylindrical portion of any mill. These brick are 4" wide x 6" long as compared with face dimensions of 2" wide x 6" long for conventional brick.

These large size brick, which are made to very close dimensional tolerances, for both heads and shell were made available because the

useful service life of the mill lining can be increased substantially merely by reducing the number of brick edges and cement joints exposed to the pounding, wearing action of the grinding balls and batch material. With the Coors design, the lining for any mill will have about one-half as many joints as will be required when 2" x 6" brick are used.

(c) **Lifter Bars** that are integral with the 4" wide x 6" long shell brick are available in Coors liners of 1 1/2" thickness. Several longitudinal courses of lifter bar brick may be incorporated in the shell lining to increase ball action and speed grinding.

The lifter bar is a part of the brick and has the contour of a half-round formed to a 1" radius. The 1 1/2" Lifter Bar brick is 2 1/2" thick at the crest of the integral lifter bar. The curvature blends into the flat surface of the brick as shown in the photograph.

(d) **Coors Mill Lining Brick** is made of a special high density alumina ceramic that was developed

specifically for the manufacture of grinding balls. This ceramic has the hardness, toughness and high strength characteristics to make it extremely resistant to the abrasive conditions encountered in pebble mill service. It has been proving its durability since 1949 in the form of grinding media in mills used for grinding paint pigments, enamel frits, cements, minerals, etc.

Coors Standard Liner Brick are made in two thicknesses only:

1 1/2" — either Plain or with Integral Lifter Bars.

2" — in Plain only.

It is considered unnecessary to supply standard lining brick in thicknesses greater than 2" because of the high and uniform tensile properties and the extreme hardness of the ceramic used by Coors in the manufacture of this lining. Some of the important physical properties of this ceramic, from the standpoint of brick usage, are listed here:

Tensile Strength.....	18,000-20,000 psi
Compressive Strength.....	200,000-225,000 psi
Flexural Strength	45,000-46,000 psi
Specific Gravity	3.4
Color	White
Water Absorption or Porosity.....	Zero
Hardness (Moh's scale).....	9

The effect of these physical properties on mill lining life was brought out early in March, 1954 when an inspection was made of a 2" Coors lining that had been installed in June, 1949 in a 45" x 48" production mill used regularly in a paint plant. The details on this lining installation which has been in actual use for more than 17,000 hours, are given on the opposite page.

Additional information and prices may be obtained by writing LZF Industrial Ceramics — 2500 West 7th Ave., Denver 4, Colorado — National Sales Representatives for COORS PORCELAIN CO.

Inspection Report

on a 2" Coors High Density Mill Lining in service for more than 17,000 hrs. at Kohler-McLister Paint Co., Denver, Colo.

In June, 1949 a 45" x 48" pebble mill used regularly for grinding a variety of paint pastes at the Denver plant of Kohler-McLister Paint Company was relined with an experimental high density lining made of plain brick 2" thick, and charged with Coors High Density Grinding Media. This lining, furnished by Coors Porcelain Company, was made of what was then a new high density, high strength alumina ceramic that had been developed shortly before for use in the manufacture of grinding balls.

This is a general purpose production mill used for grinding many different paint materials, including the following: Enamels (yellows, reds and whites), Enamel Undercoats, Inerts, Zinc Chromate Primers, Primer Sealers, Titanium Paints, House Paints and Pliolite. The grinding consistency of these pastes is maintained at 110 to 115 Krebs units.

The mill which operates at 27 r.p.m., was charged to a 50% level using Coors 1" and 1 1/4" high density grinding balls which are made of the same alumina ceramic as the mill lining. In 1951, Coors Natural Shape high density grinding media were substituted for the round balls which had been used in this mill. The Natural Shape Media, also made of the same ceramic as the balls, was developed early in 1951, primarily for use in paint pigment dispersion work. It has the shape of a flattened sphere—or approximately that of a well worn flint pebble—and this, it is believed, results in longer service life for the media as compared with conventional round or spherically shaped balls.

Up to the present time this mill, equipped with the Coors High Density Lining and Grinding Media has been in service for an average of 12 hours per day, six days each week since early June, 1949. Thus, it has been in actual operation for about 17,470 hours during the past 4 years and 8 months—or up to March 4, 1954.

Although not a primary object of this test on mill lining, it has developed that this mill, charged with Coors high density grinding media, requires from 20% to 30%

less time to produce the proper fineness of grind than it formerly required when ordinary standard weight grinding media was used. Wear of the Coors grinding media has been very low.

On March 4, 1954 after more than 17,000 hours of operation, this test lining was checked carefully and measured as accurately as possible—with the following results:

1. Shell Lining of Mill

- (a) The bricks at the edges of the door frame were installed flush with the door frame and they are still flush—showing negligible wear.
- (b) The surfaces of the shell brick are polished and smooth. There is no evidence whatever of grooving; the wear has been very uniform, and the joints between brick are smooth and flat. The edges of the brick show no indications of chipping.
- (c) Measurement of the inside diameter of the mill reveals that the 2" shell lining brick have worn 1/4" to 3/8" maximum on a side.

2. Ends or Heads of Mill

- (a) The inside length of the mill lining originally was 39". Today the inside length between the centers of the heads, i.e., between trunions, is still 39"—indicating no measurable wear.
- (b) In the annular area of each head immediately adjacent to the shell, the inside length measured 39-3/16"—indicating wear of about 3/32" on each end lining. From this outer area, extending in to the center of the head, the amount of wear decreased very rapidly until at the center it could not be measured.

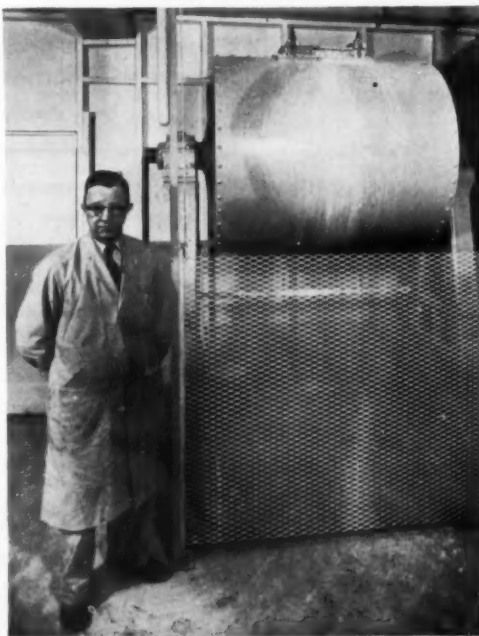
SUMMARY

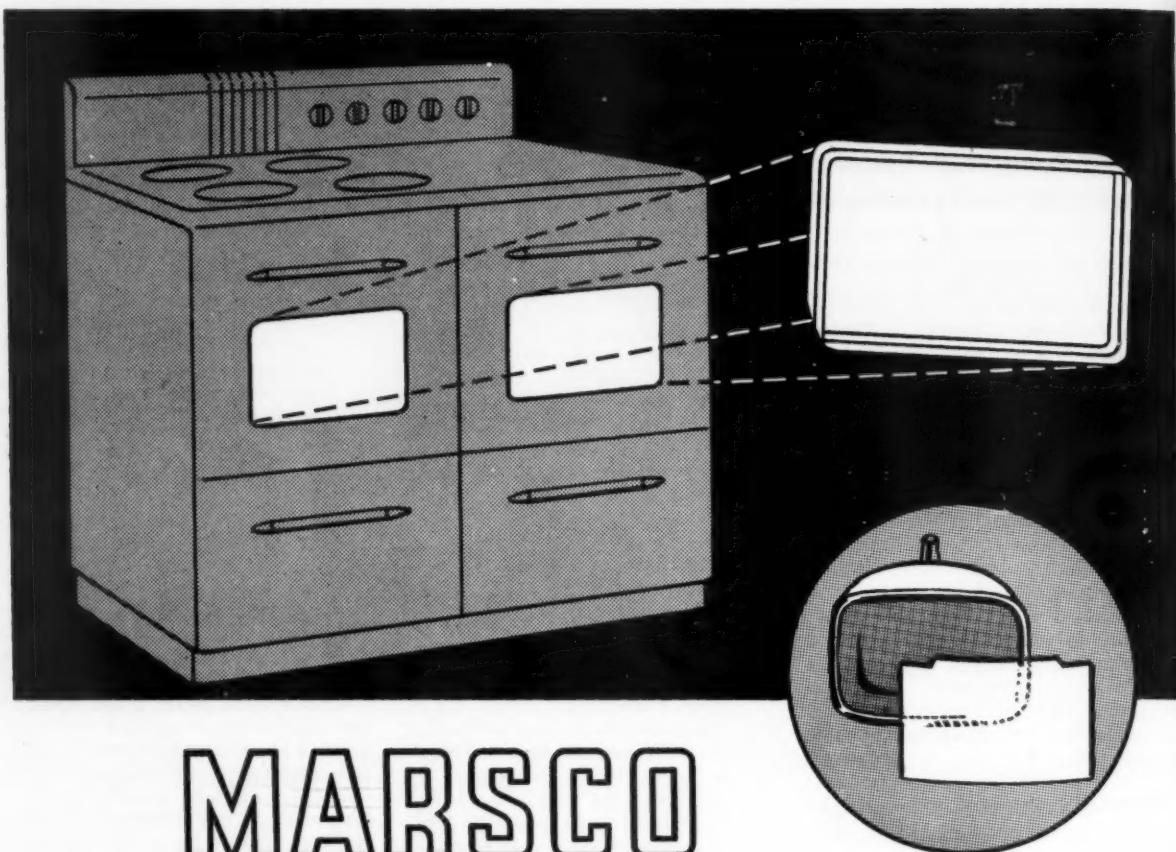
This 2" thick mill lining of Coors High Density Alumina Ceramic has been reduced in thickness due to wear, a maximum of 3/8" in more than 17,000 hours of actual mill operation. This leaves a minimum of 1 1/8" thickness of lining in this mill.

Under these paint plant operating conditions, it appears that the Coors Lining in this 45" x 48" mill (charged with Coors High Density Grinding Media) should last at least three times as long as it has already lasted—or an additional 52,500 hours—thus making the total service life about 70,000 hours.

Additional information and prices may be obtained by writing LZF Industrial Ceramics — 2500 West 7th Ave., Denver 4, Colorado —National Sales Representatives for COORS PORCELAIN CO.

Ernie Johnson, Plant Superintendent at Kohler-McLister Paint Co. stands beside the 45" x 48" mill equipped with Coors High Density Lining & Grinding Media.





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Business machines show and seminar

forty thousand key office personnel attend annual show in Chicago

THE twelfth annual Seminar and Business Show, sponsored by the Office Management Association of Chicago, in conjunction with Northwestern University, was held March 8-11, at the Conrad Hilton Hotel, Chicago.

The seminar theme was "Modern Management Horizons." Among the prominent speakers assembled for this meeting were: George L. Clements, president of Jewel Tea Co., Inc., who delivered the keynote speech at the opening session; Joseph G. Nagro, Ball Brothers Co., who discussed "Better Administration Through Better Methods"; William Hodge, Bell & Howell Co., who spoke on "A Merit Rating Plan for Executives"; and Robert F. Hurleigh, news analyst and commentator on the Washington staff of the Mutual Broadcasting System, who was the featured banquet speaker.

Concurrent with the seminar, the annual OMAC Business Show filled all available space in the hotel's exhibition hall. An estimated 40,000 office managers and other executives viewed the most scientific advancements in office machines and methods, dis-

played by more than 100 of the nation's leading office equipment manufacturers and service companies.

Among the numerous new items of equipment on display were: new addressing equipment which prints, counts, and deletes names simultaneously, displayed by the Elliott Addressing Machine Co.; the latest in metal office furniture displayed by such firms as All-Steel Equipment, Inc., The General Fireproofing Company, and Art Metal Construction

Co.; and a new type of metal filing equipment which uses magnetism to greatly simplify the filing task, displayed by Magne-Dex Sales of Chicago.

Other types of equipment shown included: accounting machines, adding machines, air conditioners, typewriters, calculating machines, cash registers, metal chairs, desks, furniture and files, fans, mailing room equipment, duplicating and printing machines and water coolers.

Alfred H. Dorstewitz, OMAC president, is shown naming Miss Dorothy Neruda "Miss Business Show of 1954."



Touching-up appliance enamels

describing the use of organic-type materials in repairing damaged surfaces

by *R. H. Albrecht* • MANAGER, PIGMENTED LACQUER DIV. THE SHERWIN-WILLIAMS CO., CHICAGO, ILL.

ALTHOUGH the usefulness of an appliance is generally unimpaired by minor defects in the finish, the article nevertheless must be sold at a considerable discount by a dealer. When the damage occurs in the home, repair service is also requested.

Touching up baked enamel finishes involves four distinct operations although all are not generally required.

1. Sanding — Feathering-in a repair should start with light sanding using #400 sandpaper so that abrupt changes in film thicknesses are eliminated, and so that there is a gradual taper on all sides. Wet sanding with water or naphtha aids in keeping the sandpaper clean. Care should be used to avoid sanding through to the steel and disturbing the chemically treated surface.

2. Prime coat — When considerable film thickness is required, or when the metal is laid bare, a primer or primer surfacer should be used to

achieve better bond and faster build.

3. The touch-up — A high gloss lacquer type coating can be applied with a touch-up gun or an aerosol applicator. Brush application is less common and has limitations for quality of work and speed of application. The initial coats are best applied slightly dry to avoid sags and to achieve faster build. High atomization pressure and greater spray-gun distance from the work contribute to this. A full wet final coat will give the leveling expected. A thinner of high solvency and proper balance to promote maximum flow and fullness without sags can contribute much to a satisfactory touch-up operation. One to one and one-half parts of touch-up thinner is used with one part of full body touch-up lacquer. If hot spray or brushing is employed the correct thinner balance should be formulated into the lacquer.

4. Polishing — When properly formulated lacquer and thinner are used, polishing is not required unless a very critical area is involved such as refrigerator door. In these areas a fine cut synthetic type polish (such as is commonly used in automotive refinish shops) is excellent for removing traces of overspray and orange peel.

Composition

Lacquers lend themselves as excellent touch-up materials because of their fast air dry, excellent color retention and good polishing properties. Nitrocellulose has recently been supplemented by more yellow-resistant film formers such as ethyl cellulose, the methacrylates, cellulose ace-

tate, cellulose acetate butyrate, etc. When properly blended with chemical plasticizers and resins using titanium dioxide as the prime pigment, the touch-up area can meet performance tests set up for baked enamel and thereby remain indistinguishable from the surrounding area.

Effect of light

Color retention under various light sources for prolonged exposures remains the number one requirement. A coating that passes sunlight or carbon arc exposure tests may show color changes from fluorescent light or even from storage in darkness such as in a storeroom. Sunlight can give a bluing or whitening action due to the bleaching of ultraviolet light whereas considerable yellowness may develop in some white finishes from storage in darkness.

Cellulosic coatings have only limited heat resistance. Some manufacturers use an accelerated test of 6 or 7 days at 150 to 160°F. for rating comparative yellowing.

A film that possesses excellent resistance to yellowing at room temperature may fail badly on this test.

A lard oil or oleic acid resistance test is another practical test since materials of this type are commonly used in the household.

Storage hazards

Occasionally, other merchandise, such as tires stored in the same area with white appliances, can cause touch-up areas to discolor. This is considered due to the preferential absorption of stabilizers from the

to Page 80 →

R. H. ALBRECHT



Patching porcelain enamel

stressing also the importance of "preventive maintenance" measures

by *A. S. Ault* • VICE PRESIDENT OF SALES, CHICAGO VITREOUS ENAMEL PRODUCT CO., CICERO, ILL.

WERE it possible to use ceramic materials, the patching problem of damaged porcelain enameled parts would be greatly simplified. But, of course, the temperatures of around 1500° F., which ceramic materials require to mature, cannot be attained in the home or in the dealer's shop where the need for patching is greatest. Therefore, any materials which are used for repair of damage certainly will not have the durability and other characteristics such as scratch resistance, color stability, etc., that the original porcelain enamel finish possesses.

Another very important point is that today's porcelain enamels are vastly different from those of a few years ago. Today the hazard from chipping or impact damage is reduced due to thinner applications. Today, enamel thicknesses have been reduced to the point where 8 to 10 thousandths is all that is needed for coating in both ground coat and cover coat used on home appliances.

We all know that damage can occur to any finish. And most of the damage that does occur is due to rough handling and abuse, whether it occurs to porcelain enamel, paint, or other finishes. You may have seen washers, dryers, or other appliances damaged as a result of a load shift in a railroad car, for example, or as a result of an accident to a motor carrier, or by improper handling by shipping personnel. It's too bad that this sort of thing occurs, but when it does, there's only one thing left to do—repair the damage as best you can.

Type and cause of damage

In discussing the patching or repairing of porcelain, we must first look at the type and cause of damage that needs repair. It might be said that there are two damage situations that arise: (1) damage which may occur during manufacturing operations, and (2) damage which may occur to the product in use. In many cases the first type of damage is controllable whereas the latter type is beyond the control of the manufacturer. When I say that the first type is controllable, I say it in the sense that much damage is due to either weaknesses in design, poor fabrication of the product, or inadequate packaging. In connection with design and fabrication, I would like to call attention to Technical Bulletin T-14, "Design and Fabrication of Metal Parts for Porcelain Enameling", issued by the Porcelain Enamel Institute.

"Preventive maintenance"

Over a period of years, frit manufacturers have been not only willing but eager to assist manufacturers of home appliances in correlating the use of porcelain enamel with product design and fabrication. Too frequently a product is designed and fabricated without complete consideration being given to the requirements of porcelain enamel as a coating. In other words, there has been insufficient consultation between the design engineering department and the finishing department. Design that is properly suited to the processing conditions that porcelain enamel imposes

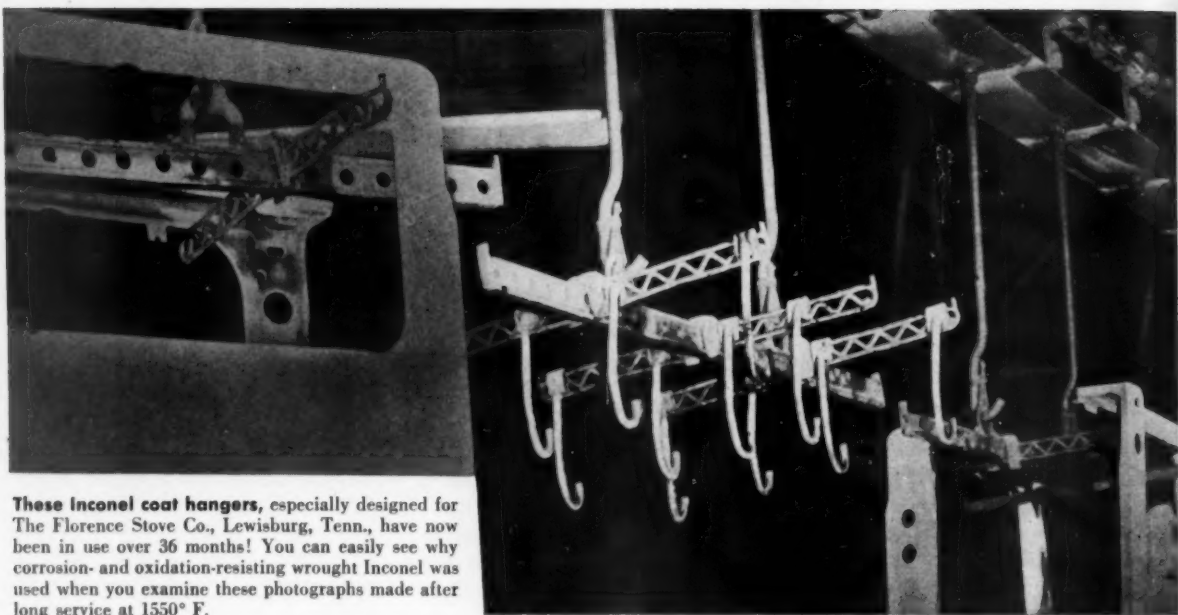
cannot help but result in less damage in assembly as well as less damage in service. This is closely akin to preventive maintenance on your automobile or on the machinery in your plant.

Another factor that is controllable is proper packaging to assure safe delivery of the packaged product. Without going into great detail on the National Safe Transit Program, I cannot help but point out how packaging that is designed to protect the product in transit (rather than just cover it) can result in a decrease in shipping damage. There are many specific instances where slight changes in product design and/or packaging have saved appliance manufacturers many thousands of dollars and have helped increase goodwill on the part of their dealers and consumers. So much for the "preventive maintenance" side of the picture.

to Page 80 →

A. S. AULT





These Inconel coat hangers, especially designed for The Florence Stove Co., Lewisburg, Tenn., have now been in use over 36 months! You can easily see why corrosion- and oxidation-resisting wrought Inconel was used when you examine these photographs made after long service at 1550° F.

Inconel Coat Hangers

*... 36 Months
with no time out*

Are you troubled with bulky and heavy burning tools that require extra maintenance and give a short service life?

If you are, take a look at these lightweight Inconel® fixtures. They were designed for THE FLORENCE STOVE COMPANY, Lewisburg, Tenn.

These fixtures have been in continuous use for over 36 months operating at 1550° F. and they are still in excellent condition.

They have required a minimum amount of maintenance. And what's more, fuel consumption has been *lowered* because Inconel's strength at elevated temperatures permitted the design of thin sections resulting in lightweight tools.

Enamel spoilage also has been reduced. For Inconel resists both corrosion and oxidation. And its tightly adhering oxide film resists scaling and spalling.

Inconel is ductile and readily fabricated. And Inconel welded joints are as strong and heat-resisting as the alloy itself. This enables you to design for efficient furnace use and still have all the strength and corrosion resistance you need.

Are you troubled with a high temperature equipment problem in your operation?

Inco's High Temperature Engineers would like to work with you to find a solution.

Possibly they already have the answer among the accumulated data they have acquired through research on similar problems.

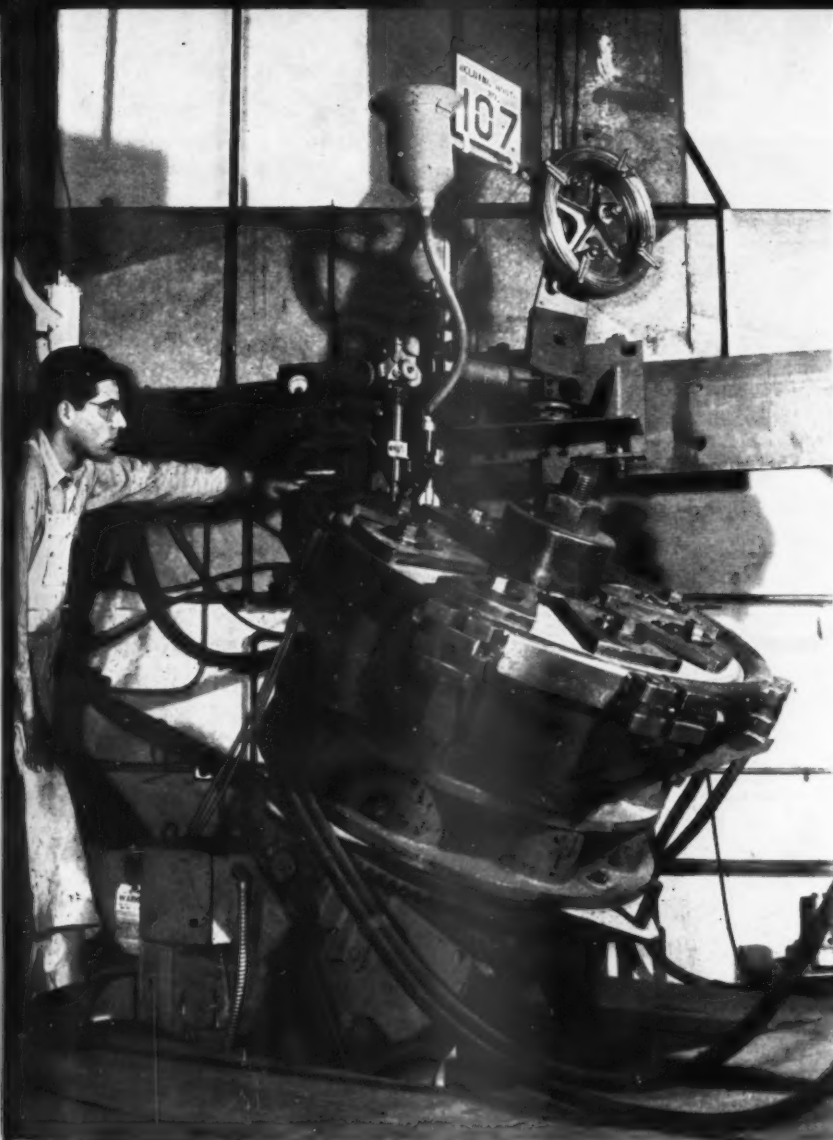
To help them get started, send for a copy of the High Temperature Work Sheet. It is designed to help you outline your problem.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.



Inco Nickel Alloys

INCONEL...for long life at high temperatures



In a Ryan-built rotating fixture, operator welds a heavy jet engine burner plate with the Unionmelt process. The arc is avalanched in powdered flux.

Faster fusion

Part II— inert gas-shielded metal arc welding and submerged arc welding

by J. R. Fullerton • CHIEF WELDING ENGINEER, RYAN AERONAUTICAL CO., SAN DIEGO, CALIF.

FOR speed in welding, inert gas-shielded metal arc — Sigma — makes other types look slow. This amazing method has been clocked at 200 inches a minute with 1/16" material. Even in 1/2" plate, structural welds can be made at 48 inches per minute.

Sigma uses a consumable wire electrode which is fed at high speed through a blanket of argon gas and melted into the weld area. Like Heliarc, it produces high quality welds with deep penetration, and lends itself to automatic operations. Sigma welding can handle twice the current

densities which are used with Heliarc.

Ryan uses Sigma to weld exhaust system nipples to port flanges and join ball sections to exhaust tubes. These components are about 2 1/2" in diameter and are welded circumferentially. For welding the nipples to the flanges, a new machine has been found phenomenal in its effectiveness.

The welding unit used is powered by a 400-A motor-generator. The unit is mounted on a custom-built fixture which incorporates a sliding carriage with two revolving holders that turn at constant speed. Each holder is a small expanding mandrel which firmly retains the nipple during welding and quickly releases it when contracted. The carriage moves back and forth through an 18-inch travel to bring the nipples directly under the electrode of the Sigma welder. It is operated by foot control.

The operational sequence goes like this: the operator places a nipple on one of the revolving holders and presses the foot pedal. The carriage shifts to bring the nipple under the electrode. As it moves, the carriage trips a micro-switch which starts the welding cycle and the arc strikes. Current used is 250 amperes, reverse polarity d.c. The light of the arc plays upon a photo-electric cell which trips a relay that automatically times the welding run and switches off the arc. All the operator has to do is shift the carriage and replace the nipples. With two holders, one nipple is being welded while the other one is being replaced by the operator.

Formerly it required three minutes of manual welding plus finishing to do one of these nipples. With the new machine it takes only 7 seconds to attain a sound, clean weld which requires no cleaning or finishing labor. A normal production for this machine is 800 nipples per 8-hour shift although as many as 1200 have been accomplished in that period. Exhaust system production uses thousands of these stainless steel com-

ponents, and it is quite evident that the new machine has substantially reduced their cost and increased their availability.

Submerged arc welding

The submerged arc welding technique—Unionmelt—is similar to Sigma welding in that it also employs a consumable electrode and permits the use of high current densities. It is different in that the shielding agent is not a gas but consists of dry, granular flux which pours down over the weld area. The arc and weld metal are fully protected from oxidation by this means. The granular flux melts and forms a fused slag which blankets the weld. The material which does not melt is recaptured and used again. The solidified slag is easily removed from the weld.

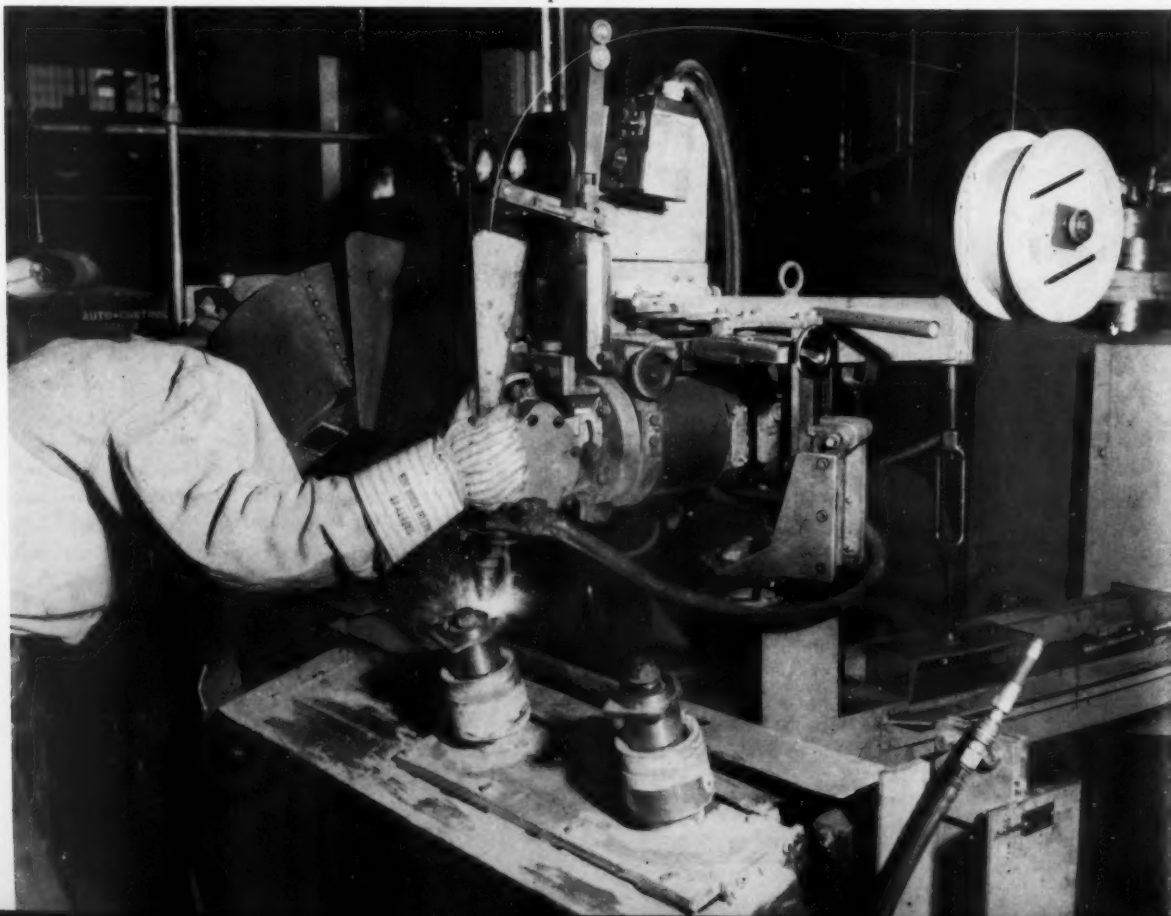
With Unionmelt, there is no arc visible, and the operation is quiet and smooth. Because this method permits the use of high density currents, much larger diameter electrodes can be used and heavier welds laid down in single passes. For this reason, it is used to weld heavy gauge materials

and lends itself to straight-away work. Speed is a salient feature of Unionmelt. Automatic machines can weld metals three inches thick in one pass, and can attain 200 inches per minute on light gauge materials.

Ryan uses this method to weld a large heavy-gauge circular burner plate and flange together. This assembly is part of the aft frame, or "backbone", of General Electric J-47 jet engines. The big burner plate is .125" thick and the flange is .075". Both components are fabricated from 321 stainless steel. The work is performed on a specially-built fixture which is rotated by means of a large weld positioner. Filler wire of 29-9 composition is added to the weld. Speeds of welding are 55 inches per minute to produce an $\frac{1}{8}$ " fillet weld in one pass.

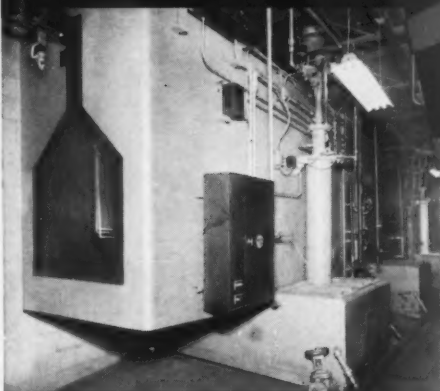
Unionmelt is employed to weld stainless steels, carbon steels, Monel, Inconel, aluminum-bronze, copper-silicon alloys and straight chrome and nickel. Smooth, sound welds can be made at good speeds with 20 pounds of metal per hour deposited.

An electronic "eye" calls "time" on a new Sigma welding machine which has squeezed the time for welding an exhaust system nipple from 3 minutes to only 7 seconds. Machine employs a fast-shift carriage and automatic operation.

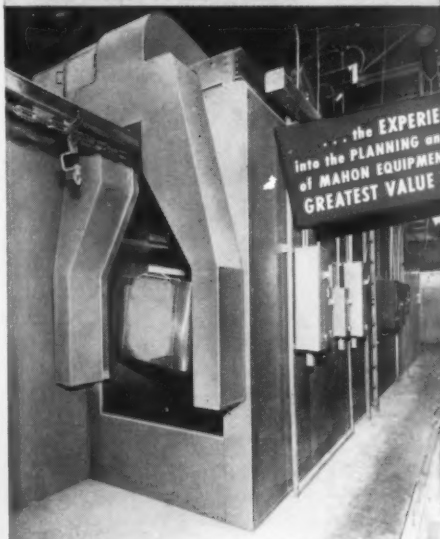


COMPLETE *Finishing* SYSTEMS

... for ENAMELS • LACQUER • PAINT • VARNISH

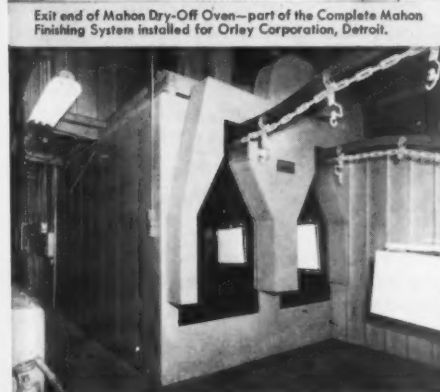


Mahon Metal Cleaning and Rust Proofing Machine with modern FIRE-JET Heating Units—part of the Orley Installation.

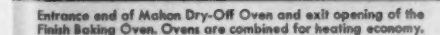


Interior view of Mahon Hydro-Filter Spray Booths with HYDRAIRE Flood Sheets and Adjustable Air Flow Control which makes for excellent working conditions in Orley's Modern Finishing Department.

... the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



Exit end of Mahon Dry-Off Oven—part of the Complete Mahon Finishing System installed for Orley Corporation, Detroit.



Entrance end of Mahon Dry-Off Oven and exit opening of the Finish Baking Oven. Ovens are combined for heating economy.

ORLEY HOME FREEZERS and Other Appliances Receive FINE FINISH in MAHON EQUIPMENT!

Orley Corporation, manufacturers of Orley Home Freezers, and contract painters for other appliance and automobile manufacturers, rely on Mahon Finishing Equipment to produce the quality finish demanded for their own products and for the products of their customers. Major elements of the Orley installation are illustrated here . . . it is another typical Complete Mahon Finishing System including Metal Cleaning and Rust Proofing Equipment, Dry-Off Oven, Hydro-Filter Spray Booths, and a Finish Baking Oven. The choice of Mahon equipment was a wise and logical decision . . . because, more home appliances and more automobiles are painted in Mahon Finishing Systems than all other types combined. If you are contemplating new finishing equipment, you, too, will find Mahon engineers better qualified to advise you on both methods and equipment requirements . . . better qualified to do the all-important planning, coordinating and engineering of equipment—which is the key to fine finishes at minimum cost. You will also find that Mahon equipment is built better for more economical operation over a longer period of time. Mahon's background history in this highly specialized field covers thousands of Complete Finishing Systems including Dip, Flow Coating, and Spray Equipment for every conceivable product painted on a production basis. See Sweet's Plant Engineering File for information, or write for Catalog A-654.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.
Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other units of Special Production Equipment.

MAHON



REPUBLIC ELECTRO PAINTLOK provides a fine, long-lasting finish

The Mills Company, Cleveland, uses Republic Electro Paintlok in fabricating doors, fronts and panels for their Marblmetal line of toilet compartments. Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers and synthetic enamels, and to hold them for years.

In addition to providing a smooth, lasting finish, Electro Paintlok affords this company other advantages and economies:

1. There is no cracking, flaking or peeling during fabricating or finishing operations. Electro Paintlok forms easily.

2. The zinc coating guards against underfilm corrosion should painted surfaces become scratched.

3. Only a simple cleaning with a water-soluble cleaner is needed to prepare Electro Paintlok for application of the baked-on enamel finish.

4. Surfaces are pre-conditioned for applying the baked-on enamel finish. No pre-etching is required.

Write for Republic Booklet 525. It tells the complete story on how Electro Paintlok can add eye appeal to your fabricated steel products.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES • CLEVELAND 1, OHIO
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REPUBLIC ELECTRO ZINC PLATED SHEETS

ELECTRO PAINTLOK • ELECTRO ZINC BOND



Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron



Andy, Industrial Rayon; J. R. Foster, Dravo Corp.; B. Adfrey, du Pont; and C. W. Fuller, C. K. Williams.



C. E. Olson, Pittsburgh Plate glass; S. D. Hollis, Watson Standard; and T. G. Roskos, A. O. Smith Corporation.

Symposium on industrial finishes

Third short course at Case Institute of Technology, March 10-12, includes discussion on recent trends in coatings formulation and progress reports on new developments in paint application

(illustrated with finishphotos)

THE keynote of the 3rd annual symposium on Recent Advances in Industrial Finishes, was "paint as an engineering material in industrial applications". The intent was to review, expand, and apply the concept of engineering principles toward the improvement of performance of coatings in the industrial field.

The program provided for the appraisal of existing situations against a background of factors leading to it, its directional trends, and projection into future materials, techniques and behavior characteristics.

Laboratory experimentation, with its implied significance, was covered with reports on the limited field experience on practical applications of these experiments. Specialized materials and their performance were also reported on.

Despite the speed with which the speakers and audience dispatched troublesome problems of the past, the abundance of new and as yet unsolved problems occurring, coincidental with the field trials of newly

developed coatings, clearly indicates the continuing need for such mutually assistant meetings as this one.

W. Von Fischer and E. G. Bobalek, of the Case Institute of Technology, elaborated on "Recent Trends in Coating Formulation," in order to develop for the group how the relationship between the paint formulator and the raw material suppliers has been changing. The formulator of old received only partially processed raw materials and completed processing himself. This permitted the formulator to exert influence over the behavior of these materials but required extensive knowledge and processing equipment. The trend has been toward the more complete processing of the raw material by the supplier. This tends to fix the behavior characteristics of the materials, limiting the latitude of the formulators, relieving them of the necessity for equipment and comprehensive knowledge of these materials. At the same time, this makes the connection between the processor and the

customer more remote, thus requiring more active liaison if rapid and consistent progress is to continue.

Efforts to develop coatings with improved service performance tends toward materials more difficult to apply. Special methods and equipment are being developed to satisfy these requirements.

Electrostatic spray and flow coating

C. O. Hutchinson, technical service director, Nubian Paint and Varnish Division, The Glidden Company, Chicago, presented bar graphs of usage and savings with the various types of electrostatic and flow coating systems showing the actual and potential savings as compared to hand and mechanically automatic spraying. The savings shown were impressive, as much as 50% of the original paint cost, with the equipment paying for itself in as short a time as 60 to 90 operating days. The advantages and disadvantages of each system was discussed.

The behavior and problems asso-

G. Munck, National Carbon; E. G. Bobalek, Case Institute; D. L. Toda, National Carbon, enjoy a little respite.

L. Nusser, E. W. Weith and L. S. Long, of Glidden Co., getting viewpoint of John Benjamin, General Mills, Inc.





C. F. Waite and Lee Ford, King-Seeley Corp., with Ross Galati, Braden Sutphin Ink, and Wendell Mason, Huntington Laboratories.



Here we see E. G. MacPherson & G. C. Schmidt, Monsanto Chemical; H. M. Anderson, Surface Combustion; D. G. I. sax, Bronco Solvent.

ciated with Resin systems when applied at extreme thickness was then taken up. The difficulty in getting uniformity and the pending development of the multiple material feed guns to solve this problem was discussed.

The position of thermoplastics, silicones, silicone-phenolic, and phenolic resin films relative to one another was presented.

The advantages to be obtained in extensibility, durability, and resistance to chemical attack through the addition of rubber base emulsified paint to Vinyl plastic was pointed out.

Discussion then went over the part oxygen plays in maturing the coatings, the part played by such oxygen-carriers as cobalt and manganese. This lead to a discussion of contaminated atmospheres in ovens and its effect on coatings.

English auto bodies revolved in automatic spray method

S. W. Farrell, assistant technical director, Ferbert-Schorndorfer Co., showed a movie of the automatic

painting of English automobile bodies. The bodies were clamped on a revolving spit and rotated around their long axis while being drawn past automatically positioned, aimed, and triggered spray guns.

Nuclear tracing used to control film thickness

J. R. Bradford, of Case Institute, presented several industrial applications of nuclear tracing in continuous processing systems. Slides of installations were shown with the savings in material brought about through the use of this equipment. It appears this system is effective in improving quality as well as reducing waste and therefore cost. Applications of this system included usages where either bounce, penetration, or transfer of the radioactive tracer technique were used.

Paint coatings cured at reduced temperatures

H. L. Barneby, president, Chemical Process Co., reported on a new process wherein a chemical agent af-

fected surface hardening of a paint in a matter of a few minutes, allowing the freshly painted part to be handled and packaged. This presentation drew a particularly large number of questions from the audience with discussion time exceeding delivery time.

Wash primers

M. D. Phelps and H. Rosenbloom, of Specialty Coatings, Inc., collaborated in delivering a paper on "Resin Bonded Chemical Treatments For Metal Surfaces". The field and practical side was covered by Phelps; the laboratory and theoretical, by Rosenbloom. Wash primers were the chief subjects. The relative effectiveness of the types, zinc chromate, lead chromate, chromic phosphate (pigment), and chromic phosphate (complex) and red lead with raw linseed oil was outlined.

Rosenbloom presented a series of graphs and charts indicating the results of numerous experiments aimed at determining the nature of the chemical reactions taking place during the drying. Theories on oxidation phenomena and those involving reactions between phosphoric acid and other components were advanced and substantiated by readings of the changes in pH and the electromotive force in the paint effected by changes in its composition. The ability to form and disperse gels was explained as well as the inability to do this after certain other reactions, including the precipitation of insolubles, had taken place.



Pictured here are S. W. Farrell, J. R. Bradford, H. L. Barneby and C. O. Hutchinson, members of panel reporting on New Developments in Paint Application.

E. M. Taney, du Pont; E. E. Jukkola, Wright-Patterson Air Force Base and W. S. Hamilton, Boeing Airplane Co.



L. Nusser, Glidden; G. J. Cavanaugh, G.E.; I. J. Steltz, B. min Foster; G. F. Croad, Stebbins & Roberts, listen intently.



How a Fosbond cycle including Actidip can CUT YOUR PHOSPHATIZING COSTS AS MUCH AS 40%

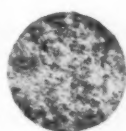
If Your Company Now Applies Zinc Phosphate Paint-Bonding Coatings, This Is "Must" Reading For You!

A key component in Pennsalt's all-new Fosbond® Process is Actidip. Proper use of this extraordinary activating agent can cut consumption of zinc phosphating solution as much as 40% by reducing crystal size—and also assure a better, smoother organic finish. Because the phosphatizing bath is the major expense item in a paint-bond process, the reduced consumption possible with a Fosbond cycle including Actidip therefore can save thousands of dollars annually for any major user!

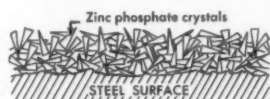
In many other ways, the Fosbond Process is just as noteworthy. It consists of a complete series of products and operations for *trouble-free* phosphatizing of metal prior to organic finishing. Fosbond locks finish to metal, and provides lifetime corrosion resistance. To get the process working smoothly in your plant and to keep it that way, Pennsalt offers the services of metal processing specialists.

Like To See Test Panels? Prove to yourself just how good Fosbond is! We'll send you test panels, or Fosbond chemicals with which you can make your own. Tell us, 1) type metal to be coated, 2) phosphate coating now used, 3) method of application, 4) organic finish used, 5) conditions finish must meet. Or, tell us about your phosphatizing operation, and we'll answer your questions as specifically as possible.

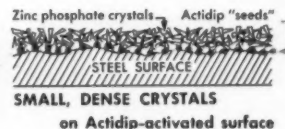
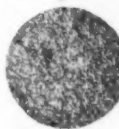
Better yet, say the word and we'll have one of our men tell you about Fosbond in person! Write: Customer Service Dept., Pennsylvania Salt Manufacturing Company, 526 Widener Bldg., Philadelphia 7, Pa.



(unretouched)
photomicrographs



LARGE CRYSTALS
on non-activated surface



SMALL, DENSE CRYSTALS
on Actidip-activated surface

How Actidip Works

Zinc phosphate crystals begin "growing" on steel from a starting point or nucleus. On a non-activated surface, growth is uncontrolled. Result: large crystals, high consumption of phosphatizing solution, irregular surface requiring more paint to cover.

Pennsalt Actidip "seeds" the surface with thousands of nuclei. Result: a controlled, more uniform, smaller crystal structure; a minimum of solution consumed to fully coat surface (up to 40% less); equal or better corrosion resistance with lighter coating due to more complete surface coverage; less paint to cover—or a smoother finish with same amount of paint.

The use of Actidip on certain steel surfaces which won't take an adherent phosphate coating has actually made it feasible to produce good coatings on these surfaces.

Actidip is applied by spray or immersion methods—by itself or compounded with a Pennsalt Cleaner. Actidip baths have long life and require no chemical control as the action of Actidip is a physical phenomenon and involves no chemical reaction. For best results, Actidip should be used in a Pennsalt-designed Fosbond cycle.

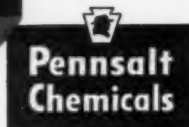


Fosbond has qualified for the Good Housekeeping Guaranty Seal, which is part of the colorful Fosbond emblem. Authorized Fosbond users may include this nationally-advertised emblem in their sales literature, product tags, etc., thus benefit from a proved merchandising device.



Actidip is a
Pennsalt trade mark

*A better start
for your finish*



Supplies and Equipment

D-10. Hermetically-sealed thermostat for use where moisture, corrosion, or dirt is a factor

New This new hermetically-sealed thermostat, which gives quick make and break operation for close control is designed for

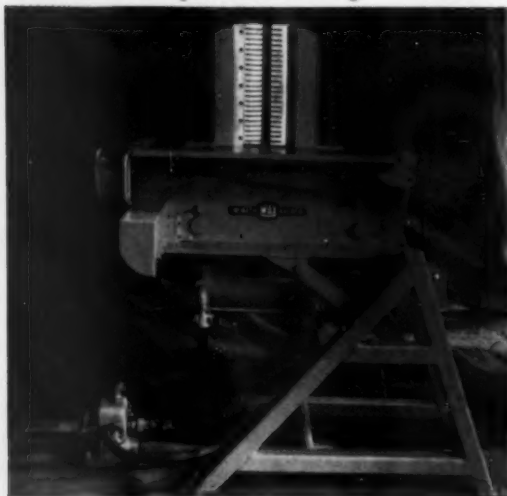


applications where moisture, corrosion, dust, or altitude might adversely affect thermostat life or performance, or for use in explosive atmospheres.

One of the design features is an insulated, electrically independent bi-

D-11. Brake operates in vertical or horizontal position

New An open-end, all-purpose brake is designed to operate in either a vertical or horizontal position. Dies protrude from the table which houses the mechanisms, with the table acting as a support as well as a squaring device for material while in the process of bending.



More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form, or write to us on your company stationery.

metal that eliminates false cycling and life shortening "jitters".

D-12. New 1000° F. dry lubricant

New A specially formulated solid film lubricant, for operational temperatures of -60° F. to + 1000° F., was developed especially for use at temperatures where other forms of lubricants have failed.

D-13. Versatile shear for slitting, angle cutting, square cutting

New A new Steelweld versatile shears operates on the pivoted-blade principle which permits square or angle cutting, slitting or notching to be done quickly. The

This leaves both hands of the operator free and facilitates accuracy.

The machine has a positive forward and reverse stroke control, making it possible to select any degree of bend and effect its operation within a matter of seconds.

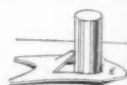
The new brake is air operated, requiring approximately 75 lbs. of line pressure to effect the maximum capacity of the machine.

Four features are as follows: (1) work is supported and squared during bending process, (2) roller bearings, supporting ram, help reduce friction and power requirement to a minimum, (3) machine operates by air and uses no energy except when in use, and (4) material is slipped on and off through open end.

standard 24" throat depth permits slitting sheets up to 48" wide on any line. For larger machines, 36" throats are available.

D-14. Fastener for unthreaded studs or rods

New This low-cost, arched spring steel fastener slips easily over unthreaded studs or rods, and locks tight with a quick push of an inexpensive applicator, for use on nameplates, mouldings and other light parts. Spring tension pulls parts snugly to base, and gripping tongs hold tightly against loosening in service. Fasteners are available for 3/32", 1/8" and 3/16" unthreaded studs or rods. *Free samples are available.*



D-15. New precision flow gun for spraying porcelain enamel

New Development of this new precision flow gun is said to represent two years experimental work by the gun's manufacturer in



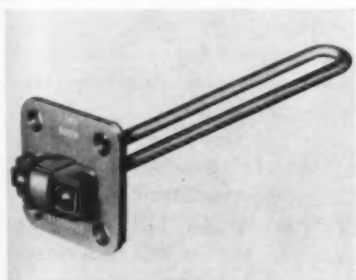
cooperation with Hotpoint which now uses the new gun in the spraying of range parts. By using stainless steel parts and a special valve, the problem of rapid wear is avoided.

The stem of the special T-shaped brass nozzle attaches to the gun. The cross-bar consists of a hollow

cylinder, both ends of which are closed. A lengthwise slot flows a 2" strip of material. By careful triggering, the flow can be precisely controlled.

D-16. New heater for water tanks, dishwashers, laundry equipment

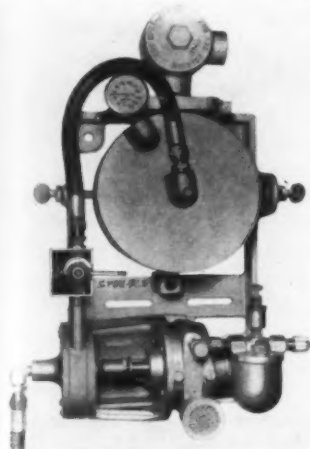
New Ruggedness and long life have been built into this Corox heater which features completely watertight terminals, thereby



preventing possible damage to tank or steel backup plate from corrosion. All parts of unit exposed to water are made of copper. New gripper type terminals provide quick and firm connection of current-carrying parts. Tube loop lengths are available from 6 to 15 inches.

D-17. Circulating paint heater maintains hot spray temperature

New Pigmented finishes and fillers can now be hot sprayed efficiently, regardless of their abrasive content with this new air Circaflo pressurematic heater which circulates the material from the heater to the gun and return to maintain a constant hot spray temperature for continuous and intermittent service. The simple



centrifugal pump has no close fitting tolerance to wear, and therefore is particularly designed for paint circulation.

D-18. Metal sheet pack turnover eliminates single sheet handling

New This new metal sheet pack turnover will turn a 6000-pound pack of metal sheets in less than 30 seconds, eliminating slow hand turning of individual sheets. The machine is said to handle metal sheets from 16 x 16" to 36 x 44" of any thickness. Maximum pile height is 27", including upper and lower carrying skids. Minimum pile is 17".

D-19. Inexpensive small spray booth

New This new spray booth is designed for small manufacturers, schools, studios, and home ceramists. It is inexpensive and shipped ready to use complete with



D-20. All-purpose shop caddy handles packaged appliances

New This all-purpose shop caddy is specially designed for safe handling of major appliances by one man. Refrigerators, washing machines, ranges, TV sets are easily loaded and unloaded, or stacked for space-saving storage.

The shop caddy is a rugged two-wheel hand truck which embodies a hydraulic lift capable of raising loads of as much as a quarter ton. It can be used for lifting dies, stacking various products, loading and un-

loading trucks. Another type of caddy can handle loads up to 3000 pounds.

D-21. New packaging, carton reinforcing pressure-sensitive tape

New This new pressure-sensitive tape for packaging and carton reinforcing was designed to meet the need of an "intermediate-



strength" Scotch brand transparent filament tape.

Its impact resistance is 50% greater than most other filament tapes, and its transparency permits its use without hiding important sales messages, trade marks, labels, or other markings on shipping containers. In addition, it's the "thinnest" (8 mils) filament tape on the market today, and it will not stretch or loosen during use of shipment.



New Industrial Literature

401. Bulletin on magnetic separators for steel sheets

New Complete information on the construction and uses of magnetic separators for fast and easy handling of steel sheets and plates is included in a new bulletin. The bulletin describes and illustrates how these units speed up production, reduce damage to machinery, and eliminate injuries to operators.

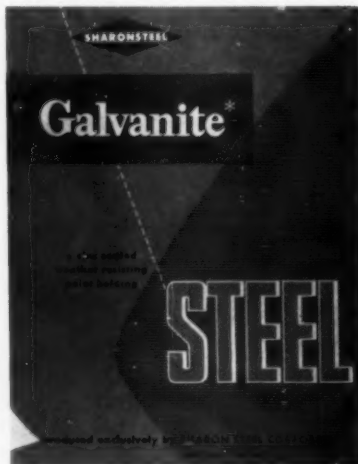
402. Design engineer's bulletin on stretch-forming methods

New This first in a series of design engineer's bulletins on metal forming, describes how an upper roof cap framing member for motor truck trailers can be formed in a single operation on a contour former. Comparison is made with

older and more complicated methods of forming.

403. Brochure on zinc-coated steel for metal products

New This 12-page, two-color fact-packed brochure on a special hot dipped, zinc-coated strip steel illustrates how this steel will weld



or solder, cold form or stamp, deep draw or blank. Among products fabricated are air conditioning units, cabinets, furnace bands, radiator covers, radio and TV parts, mouldings, etc.

404. Industrial tape catalog contains actual samples

New This new catalog contains actual samples of the following types of Arno adhesive tapes

for industrial use: plain cloth, black waterproof, olive drab waterproof, non-stain, natural rubber, flat back paper, masking, crepe paper, and glass fiber reinforcing paper tape.

405. Reducing chromic acid spray to zero in plating bath operations

New Information of how chromic acid spray now can be completely eliminated from chromium plating operations is included in new literature which describes a new surface agent called "Zero-Mist" which completely prevents air and airborne contamination from chromic acid spray and mist.

406. Porcelain enamel retail salesmen training tool

New A new booklet developed by the PEI Frit Division market development group is entitled "Selling Facts about Porcelain Enamel." The booklet, designed to train retail salesmen, briefly describes how porcelain enamel is made; points out its advantages, and describes quick, easy demonstrations that can be conducted to illustrate the material's exclusive advantages.

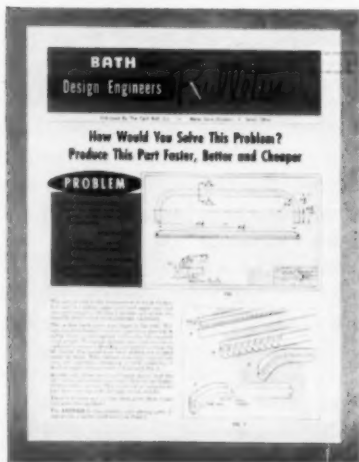
407. Steelweld presses and brakes

New Two new color booklets describe the new Steelweld lines of power shears and presses. The shear booklet describes how to do squaring, slitting or notching, while the press booklet shows how to do bending, braking, punching, blanking, drawing and corrugating.

408. "First report" on machining characteristics of leaded steel and free-cutting brass

New Machinability of free-cutting brass is compared with that of leaded steel in a new 48-page booklet which reports results of extensive, closely-controlled research laboratory tests on the two commercial metals, as well as results of six-month production runs manufacturing booster bodies of brass and leaded steel.

Comparison of leaded steel and free-cutting brass pieces produced in a 704-hour continuous production operation on Conomatic machines is a feature of the booklet.



FINISH
360 N. Michigan Ave.
Chicago 1, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. _____ No. _____ No. _____ No. _____

No. _____ No. _____ No. _____ No. _____

No. _____ No. _____ No. _____ No. _____

Name _____ Title _____

Company _____

Company Address _____

City _____ Zone _____ State _____

No other

manufacturer

can offer you

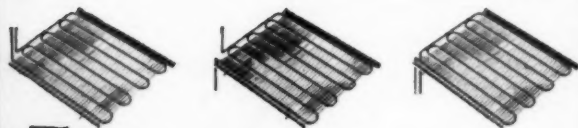
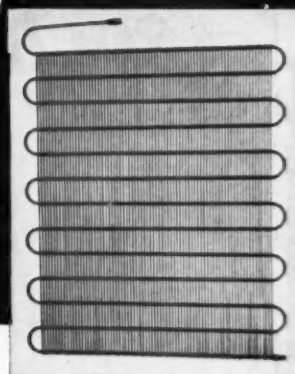
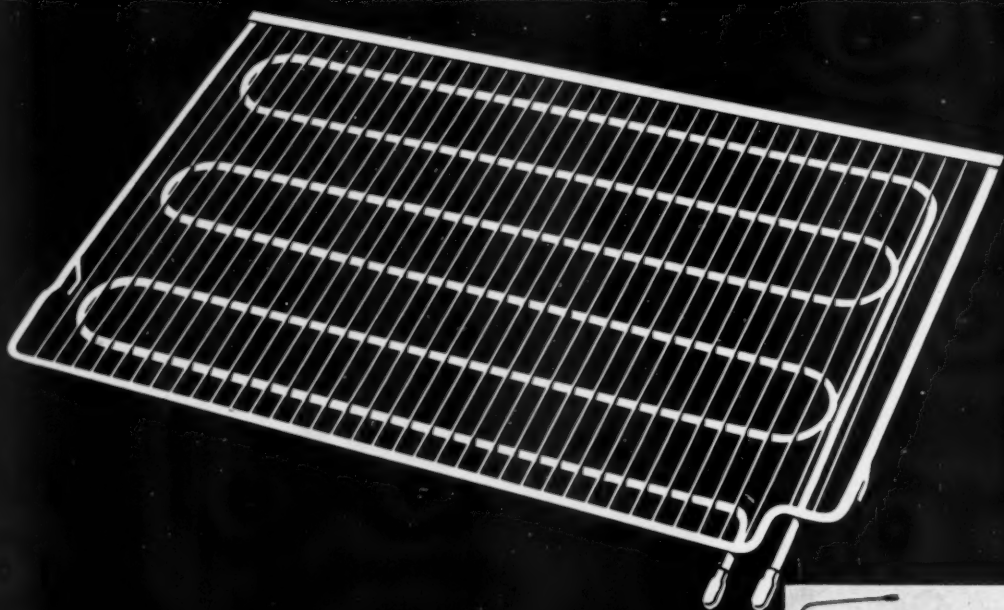
such a wide range of

**PLANT TESTED
FRITS**



INGRAM-RICHARDSON INC. OFFICES, LABORATORY AND PLANT, FRANKFORT, INDIANA

finish APRIL • 1954



UNI-FREEZE shelving attachment fittings can be located at any point where they will be most convenient for rapid, simple installation—no expensive tooling problems. Plated or painted trim mouldings can be furnished and stylized to match your designs or colors.

Please send me additional information on your:

- ☐ UNI-FREEZE Evaporator Type Shelves
☐ USP Condensers

Name: _____

Company: _____

Address: _____

City, Zone & State: _____

NEWS

FEDDERS-QUIGAN NAMES

DEFINO VICE PRESIDENT

The election of A. J. DeFino as vice president of Fedders-Quigan Corp., Maspeth, N.Y., was announced by Salvatore Giordano, president. DeFino will continue to manage the company's room air conditioning, automotive, heating, condenser, and defense manufacturing divisions.

LUKE SUCCEEDS REES

AS COOLERATOR PRESIDENT

Stanley Luke has been named president of The Coolerator Company, Duluth, it was announced by W. H. Harrison, president of International Telephone & Telegraph Corp., of which Coolerator is a division.

Gregory L. Rees, former president of Coolerator, has joined the IT&T headquarters staff.

BUSH UPS ADKINS, SINICHKO

Bush Manufacturing Co., West Hartford, Conn., has announced the appointments of D. L. Adkins as head of the quality control department, and George Sinichko as chief application engineer for the air conditioning and refrigeration divisions.

DEIG HEADS PRODUCTION

CONTROL FOR SERVEL

Carl E. Deig, formerly wing division superintendent, has been promoted to production control manager, it was announced by T. W. Rundell,

vice president in charge of operations, Servel, Inc., Evansville, Indiana. Deig joined Servel in 1930 as a member of the inspection division.

MONTAG EXPANDS PRODUCT

LINE, NAMES GEN. MGR.

Ralph T. Montag, Jr. recently assumed the duties as general manager



of Montag Stove & Furnace Works, Portland, Oregon, following the retirement of his father who had held that position for many years.

The pioneer Portland firm, established in 1880 by John Montag, Sr., makes a complete line of home heating equipment under the Comfortflo trade name, and a full line of electric ranges and hot water heaters. Now being added to their line of products are home freezers, and soon to be marketed will be Montag's new two-

piece built-in electric range.

Montag also announced the appointment of D. Eugene Parks as general sales manager. Parks had been with Mullins Mfg. Corp. from 1940 to 1951.

HOERIG TO MUELLER POST

Curt Hoerig, who joined L. J. Mueller Furnace Co., Milwaukee, over a year ago, has been named assistant to the vice president in charge of manufacturing.

CROWN ROOM COOLERS

It is reported that a line of room air conditioners made by Crown Corp., New York City, will be marketed under the Crown label by Iron Fireman Co., Cleveland.

BRIGGS MOVES GEN. OFFICES

Briggs Manufacturing Co. has announced the removal of its general offices to the Buhl building in downtown Detroit. Manufacturing facilities will remain at the Miller Avenue address, which has been Briggs Beautyware headquarters for many years.

PHILCO UPS ROSEBRAUGH

TO SALES VICE PRESIDENT

Appointment of Albert J. Rosebraugh as vice president in charge of sales for the refrigeration division of Philco Corp., was announced by James H. Carimine, executive vice president. Rosebraugh had been sales manager for refrigerators and freezers.

MUELLER FURNACE

BOUGHT BY WORTHINGTON

Worthington Corp., of Harrison, N.J., has purchased L. J. Mueller Furnace Co., of Milwaukee, Wis., according to a joint announcement by Harold P. Mueller, president of the furnace firm, and Hobart C. Ramsey, president of Worthington.

The Milwaukee company will operate as the Mueller Climatrol Division and will continue to make its full line of gas, oil and coal-fired home heating equipment. Worthington will continue to make its air conditioning equipment at Holyoke, Mass., and Decatur, Ala.

HARVESTER SALES UP 5.6%

International Harvester Co. has announced that sales of I-H refrigeration equipment for the first three months of its fiscal year beginning November 1, increased 5.6% over the corresponding period a year ago.

First quarter sales of refrigerators, freezers, air conditioners and dehumidifiers totaled \$9,162,796 compared to \$8,678,358 a year ago. R. H. Burnside, assistant manager of general sales for refrigeration prod-

ucts, reported that dealer orders have been running well ahead of a year ago.

MORE MULTI-BATH HOMES

In the three-year period 1949 to 1952, there was an 85% increase in the number of multi-bath homes built, according to the Plumbing and Heating Industries Bureau. It is expected that in 1954 new homes under construction will reach the 1,000,000 mark. This should include at least 250,000 multi-bath homes.

TEMCO NAMES BAUMAN, SMITH VICE PRESIDENTS

At its annual directors' meeting, Temco, Inc. announced that C. F.



C. F. BAUMAN

Bauman, recently appointed director of manufacturing, has been made a vice president of Temco, with the responsibility for the immediate supervision of the overall production program.

R. N. Smith, formerly secretary-treasurer, was named vice president and treasurer. Dudley Galloway was named secretary.

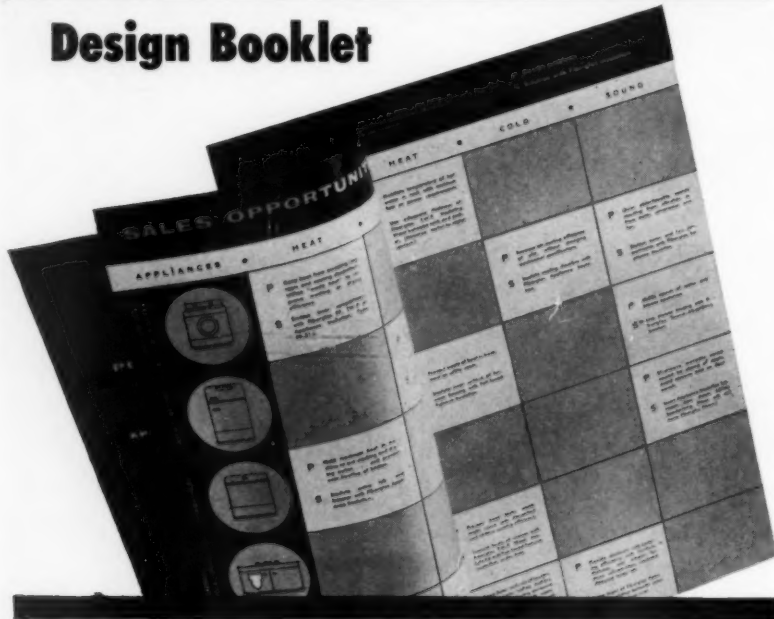
RHEEM NAMES HUGHES, KELLY

Rheem Manufacturing Co. has announced the appointments of Andrew W. Hughes as eastern regional manager in charge of all manufacturing and marketing activities on the eastern seaboard; and Thomas A. Kelly as manager of manufacturing planning, at Rheem's headquarters in Richmond, Calif.

NASH-KELVINATOR NAMES LEE DIRECTOR OF PROCUREMENT

It is reported that James A. Lee has been named director of procurement, Nash-Kelvinator Corp., Detroit. Lee joined the firm in 1936 as an air conditioning engineer. He held several engineering and sales positions with the Kelvinator Division before becoming purchasing agent for the Nash Division in 1944. He had been director of purchasing of the Nash division since 1946.

Design Booklet



—shows where Fiberglas Insulations might improve your appliances

Constant product improvement sets the sales pace in the appliance field. In this new Owens-Corning booklet, "Sales Opportunities," you may find a suggestion that could lead to improvements for your product. The booklet explores ways in which appliances of all kinds might be made better through better control of heat, cold and sound by versatile Fiberglas* Insulations. The 8 page

booklet also tells about the complete development and testing facilities of Owens-Corning Fiberglas Corporation, available to help you develop improved insulation designs for your appliances. Contact the nearest Fiberglas branch for your free copy of "Sales Opportunities," or write direct to: Owens-Corning Fiberglas Corporation, Dept. 109D, Toledo 1, Ohio.



*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for products made of or with Fibers of glass.

GLOBE AMERICAN APPOINTMENTS

Globe American Corp., Kokomo, Indiana, has announced the promotion of Gene Frazier to assistant production manager. Jim Matthews was named to fill Frazier's former position as assistant purchasing agent.

PRESSED METAL INSTITUTE

NAMES ASSISTANT MANAGER

The Pressed Metal Institute, Cleveland, Ohio, has announced the ap-



H. A. DASCHNER

pointment of Harold A. Daschner as assistant manager. Daschner was former sales manager of The Lansing Company, Lansing, Mich. He has a background of 13 years in trade association fields prior to spending the last 10 years in industry.

GAS HEAT BOILER SHIPMENTS

RISE DURING JANUARY

Shipments of gas-operated boilers for house heating systems during January increased by 7.4% over the same month last year, according to the Gas Appliance Manufacturers Association. Boiler shipments totaled 2,900 units during the month.

Gas conversion burner shipments in January amounted to 9,000 units in contrast with 9,700 shipped a year ago, but an increase of 600 over shipments to distributors and dealers during December.

Shipments of gas-fired furnace units numbered 26,900 during January, compared to 32,300 during December, and 31,100 in January 1953.

Edward R. Martin, GAMA's direc-

tor of marketing and statistics, said that the estimated shipments, based on telegraphic survey of GAMA's

house heating division members, are expanded to represent the entire industry.

TOOL ENGINEERS TO MEET IN PHILADELPHIA, APRIL 26-30

Unprecedented interest in "tooling for competition" has resulted in a record-breaking number of exhibitors for the 1954 ASTE Industrial Exposition to be held in Philadelphia's Convention Center, April 26-30, according to the American Society of Tool Engineers.

Over 30 production experts will participate in five feature panel discussions dealing with production planning "bugs", automation tooling, precision control, milling problems, and workholding ways and means, stated Harry E. Conrad, ASTE executive secretary.

LAUNDRY EQUIPMENT WINDOWS

another Lancaster service to the appliance industry

Here's why so many leading appliance manufacturers rely on Lancaster to fill their glass part requirements:

• **Quality** — precision manufacturing to meet your exact specifications.

• **Service** — delivery when and where you need it. At Lancaster there are no stock line requirements to sidetrack your order.

• **Price** — complete facilities for both hand and machine production keep Lancaster prices competitive regardless of quantity.

• **Increased Sales Appeal** — Lancaster glass has the sparkle which makes the sale.



The Lancaster glass window shown above meets the rugged requirements of commercial laundry service in the Ace Cabinet Corporation's Model D-14 dryer.



THE Lancaster Lens co.

Lancaster, Ohio

☐ Our specifications are attached. Please give us an estimate of costs on the following quantities: _____

☐ Please send me literature covering Lancaster service to the appliance industry.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____



or write for copy



Sign division—of Porcelain Enamel Institute—exhibited at the equipment show of the National Electric Sign Association's convention in Chicago March 1-3. The division consists of 16 members who manufacture either quantity or custom-built porcelain enamel signs. Featured at PEI booth was a display depicting porcelain enamel's abrasion resistance, heat resistance and the fact that it is rust-proof and fade-proof. *Huge McE. Patton, of Ingram-Richardson Mfg. Co., is chairman of the division.*

APPLIANCE MANUFACTURERS REPORT RECORD '53 SALES

Magic Chef home appliance sales in 1953 were up \$2,200,000, or nearly 10% over the previous year, according to Marc Pender, vice president, who predicted a minimum 10% increase for 1954.

General Electric sales in 1953 set an all-time record of \$3,128,127, 000, an increase of 19% over the 1952 total, stated Ralph J. Cordiner, president, who added that greatest increases were in appliances and elec-

tronics, which were up 31%.

Maytag reported sales totalling \$89,008,499 against \$86,894,946 in 1952.

Philco established a new record of \$430,420,000, an increase of 17% over 1952, William Balderston, president, and James T. Buckley, chairman, announced in the firm's annual report. It was pointed out that all major divisions of *Philco* shared in the sales gain.

Whirlpool net sales totaled \$149,129,142, or 26% above the previous year, reported Elisha Gray, president, who added that profit for 1954 should show some improvement from 1953.

Ekco, which increased its volume by 28%, set a new sales record of \$58,026,789, stated Arthur Keating, chairman. The previous high of \$45,272,914 was registered in 1952.

Hotpoint major appliance sales increased an average of 26% over 1952, reported John F. McDaniel, marketing vice president.

Servel sales for the fiscal year ended October 31 increased to a record high of \$147,586,716 from \$99,545,185 the year before, reported W. Paul Jones, president, and Louis Ruthenburg, chairman.

MERCHANDISE MART ADDS MORE PASSENGER ELEVATORS

Four new 35-passenger elevators will be added during 1954 to the 36 elevators now serving Merchandise Mart tenants, according to Wallace O. Ollman, Mart general manager.

"These new, fully-automatic elevators mark another forward step in our program of modernizing every facility in The Merchandise Mart," stated Ollman, who pointed out that during the past five years, nine new passenger elevators have been added.

Members of enamel division—of Canadian Ceramic Society—at annual meeting, February 10, at Niagara Falls, Ontario. New division officers include: Ralph Kimpton, *Kelvinator of Canada Ltd.*, chairman; and J. Crowley, *Enamel & Heating Products*, secretary. J. K. Hossack, *Ferro Enamels Canada Ltd.*, was elected vice president of the society.



ADMIRAL PROVIDING HOME DEMONSTRATION SERVICE

With the introduction of its 1954 line of electric ranges, Admiral Corporation is providing a home demonstration service for homemakers, William Mackle, range division sales manager, announced. The company already has a home demonstration program for refrigerators.

BLOME TO ENAMEL PRODUCTS

The appointment of George S. Blome as vice president has been announced by George C. Johnson,



president, The Enamel Products Co., Cleveland. Blome was formerly vice president of Baltimore Porcelain Steel Corp.

AMANA LAUNCHES BIGGEST FREEZER AD CAMPAIGN

A two-page four-color ad in the February 13 issue of the *Saturday Evening Post* was the kick-off for Amana Refrigeration's 1954 national advertising campaign, promoting their new Stor-Mor upright freezers.

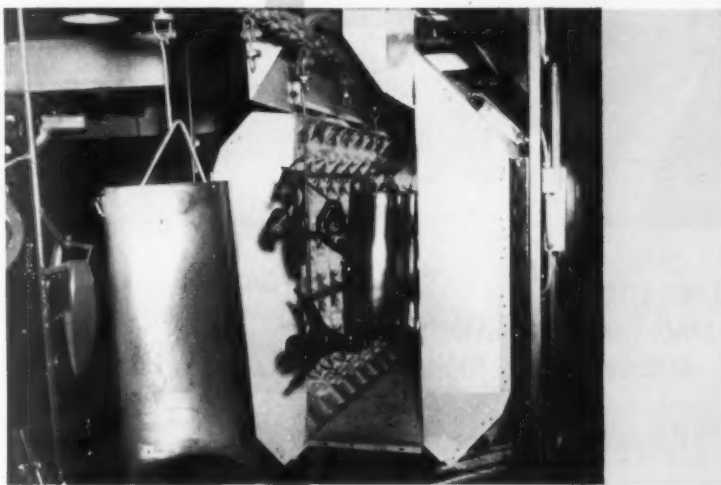
The February-through-October campaign will be Amana's biggest, and in addition, the largest ever run in the freezer industry, stated Merlin E. Morris, Amana advertising manager.

The opening ad will be followed by full-page insertions in the *Post*, as well as *Life*, *McCall's*, *Fortune*, *Farm Journal*, *Successful Farmer*, *Progressive Farmer*, and *Sunset*.

finish APRIL • 1954

TAKES LESS SPACE

GREATEST PRODUCTION
FOR OVEN SIZE • SHORTER
BAKING CYCLES • SAVES COSTS



TYPICAL OF OVER 7,000 INSTALLATIONS — Pictured above is Fostoria oven at International Harvester Co., Richmond, Ind. Baking cycle for maroon color finish on cream separator parts is 11 minutes. Connected load 30 K.W. Oven is only 11 ft. long replacing old convection oven that occupied 480 sq. ft. with 1 hour baking cycle.

Profit WITH MODERN FOSTORIA OVENS

ALL THESE ADVANTAGES

Faster Cycles
Fastest heat transfer. Greatest output to input. Instant action.

Less Space
Most production for oven size. May be ceiling mounted.

Clean Operation
No by-products of combustion. No condensation.

Uniform Bake
Evenray heat distribution with thorough penetration.

Flexibility
Adaptable to any material, any shape, any color. Infinitely variable heat levels.

Safety Controlled
No warm-up, no shut-off lag. Instant heat control.

Less Maintenance
Lowest source replacement cost. Least efficiency loss.

Highest Efficiency
Less than 2% energy loss. Heats product — not oven walls.

Cuts Costs
Lowest "per piece" production cost. Competitive initial cost.

Reliability
Foremost engineering "know-how" and service.

Why handicap your production efficiency with obsolete equipment? Investment in modern, cost-cutting mechanization is today's necessity for industrial progress and profit. A typical example is the modernization of baking operations. Already over 7,000 plants have switched to the high efficiency Fostoria oven. Anything that can be baked, can be baked better, in less space, at lower cost with a Fostoria Engineered oven installation. Low energy loss; fast, uniform heat transfer; automatic controls and wide flexibility make Fostoria the most efficient of all industrial ovens. The extensive benefits of these advantages to your production are well worth your immediate investigation. Request the expert on-the-job assistance available to you by Fostoria field engineers. There is no obligation.



SEND FOR COMPLETE FACTS

Write for this brochure of technical facts and case histories of many Fostoria oven installations. Tell us your particular problem and we will include data directly applicable to your operation.

THE FOSTORIA PRESSED STEEL CORP.
Fostoria, Ohio, Dept. F
Please send information on ovens for

Name _____
Company _____
Street _____
City _____ State _____





Westinghouse — new regional managers for major appliances. Seated around conference table at their first meeting at major appliance division headquarters, reading clockwise, are: W. T. Baker, Pacific Coast; M. E. Lanning, southeastern; R. J. McDonald, eastern; G. H. Meilinger, division sales manager; R. J. Sargent, manager of major appliances; R. C. Dunson, southwestern; W. A. Douglass, central; and R. C. Walker, northwestern.

INLAND STEEL SELLS SPACE HEATER BUSINESS TO HERRON STOVE & FOUNDRY

Inland Steel Container Co., a division of Inland Steel Co., has announced the sale of its gas space heater business to Herron Stove & Foundry Co., of Chattanooga, Tenn.

Herron is taking over from Inland the machinery, dies, equipment, designs, sales records and finished

goods inventory. It will carry on the manufacture and sale of the Com-forteer line of gas space heaters which Inland produced at its New Orleans plant. Herron will move the equipment to Chattanooga at once.

ERIE ENAMELING SECRETARY, AND TRAFFIC MANAGER

The board of directors of The Erie Enameling Co., Erie, Pa., have elected

Herbert R. Spencer, Jr. to the post of secretary, and Arthur Forsman as traffic manager.

CONLON-MOORE PURCHASES CONLON BROS. EQUIPMENT

Machinery, tools, dies and other equipment used by the former Conlon Bros. Mfg. Co., Chicago, have been purchased by Conlon-Moore Corp., Chicago, according to an announcement by Bernard J. Hank,

★ A Gear Motor for SMALL APPLICATIONS



Our line of small induction motors is designed for applications where small power can be converted to considerable torque at slow output shaft speed. Hundreds of thousands are in use today for operating relays, vending, amusement, coin operated machines, motion displays, combination rotisserie and broilers, etc.

These motors are made in three basic sizes—speeds from 1 to 200 r.p.m. with proportional torque from 5 to 500 in. ounces. Write today for descriptive information, prices and data sheet.

Motor Research Company
1600 JUNCTION AVENUE
RACINE, WISCONSIN

Designers and Manufacturers of
SPECIAL INDUCTION MOTORS

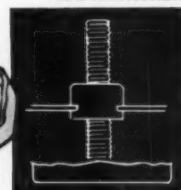


FOR LOWER COST "FIXED" FASTENINGS IN BLIND ASSEMBLIES

GRIPCO "CLINCH" NUTS



This is how leading appliance manufacturers get lower cost fasteners into inaccessible places.



← Cross-Section view after pilot has been clinched and bolt inserted. Can be locked at any point. (Non-locking nut can be supplied if preferred.)

For "hard to reach" places a Gripco "Clinch" nut holds tighter, wears longer, reduces mechanical failure for greater customer satisfaction. Provides added threading depth for applying bolts to thin metals. Holds product rigid in its container during shipment and holds the adjustable "levelers" tight for product installation and use. Used by leading appliance manufacturers.

GRIP NUT COMPANY
"After 50 years—still holding strong"
300-Q S. MICHIGAN AVE., CHICAGO 4, ILL.

WRITE FOR
SAMPLES AND
FULL DETAILS

president. Conlon-Moore also acquired the right to the name "White Way" for home laundry appliances.

The equipment purchased will be utilized in production of three conventional washers to be added to the Conlon-Moore line, Hank declared.

RHEEM DECENTRALIZATION PROGRAM MOVES GENERAL PURCHASING TO CHICAGO

Rheem Manufacturing Co. has added a new two-story unit to its Chicago offices. The new space has room for 14 offices which will be occupied by the general purchasing and personnel departments, and eastern division product managers, formerly in the east, as well as the local purchasing department.

This is an added step in Rheem's program of decentralization which involves the moving of certain functions from the firm's New York City and East Coast offices to Chicago where is located one of the two largest of Rheem's 12 factories.

MATERIAL HANDLING INST. SPRING MEETING, APRIL 13

The Material Handling Institute has announced that its spring meeting will be held at the Drake Hotel, Chicago, April 13. C. B. Elledge, Institute president, will preside.

TO WEST COAST ENAMELERS

The following is an excerpt from a letter just received at the *finish* offices:

"I have been advised to move to the West by the family doctor because my youngest daughter has very bad attacks of asthma. I have worked 24 years in enameling stoves, the last six and a half years as a foreman. My interest is in this type of work and I would like to continue in this field. I am 47 years old. I would appreciate it very much if you could advise me concerning placing an ad in your magazine."

Due to the nature of this request, it was decided to present this inquiry in the news columns of *finish* in preference to selling an advertisement to this gentleman.

Communications from any interested stove manufacturers or enameling firms on the West Coast will be forwarded promptly without charge.

finish APRIL • 1954

MORE MAYTAG EXPANSION

The Maytag Company, Newton, Iowa, has announced that it will make substantial expenditures this year for improving and enlarging

production facilities. The project involves consolidating and expanding facilities for metal treating and electroplating in a new building at a cost of 1½ million dollars.

ANNOUNCE PROGRAM FOR ACS ENAMEL DIVISION

At the 56th annual meeting of the American Ceramic Society, to be held at the Palmer House, in Chicago, April 19-23, the program for the Enamel Division will include the following papers:

"An Apparatus for Automatically Recording Strains between Enamel and Metal as Determined by Means of Split Rings"; "The Determination of Stresses in Enamelled Cast Iron"; "Calibrated Porcelain Enamel Coatings for Stress Analysis"; "Stability of Acid-Resistant Red Porcelain Enamels"; "The Effect of the Oxygen Con-

tent of the Furnace Atmosphere on the Adherence of Sheet-Iron Ground Coats"; "Thermodynamic Data on Oxides at Elevated Temperatures".

"Mechanics of Enamel Adherence"; "Application of Flame Spectrophotometry in the Determination of Alkalis in Feldspars"; "Effect of Smelting Treatment on Abrasion Resistance of Commercial Dry Process Enamel"; "Ceramic Coatings for Nuclear Reactors"; "Protection of Low-Strategic Alloys with a Cr-B-Ni Cermet Coating"; "The Application of Colorimeters in Enamel Color Problems", and "Applications of Color Difference Measurement in Porcelain Enamels."



TIMELY FINISHING TIPS



Platers in major industries depend on the experience and know-how of Naraco engineers to solve difficult plating rack problems. Such was the case with the illustrated rocket shaped hood ornament.

The problem of chrome plating without burning the ends of piece parts was answered with a rack designed for efficient, economical plating. Six parts are held firmly by means of a spring clip; accurate spacing and robber bars produced a uniform chrome deposit, free from any shading or burning.

Take a timely finishing tip from platers who know the value of Naraco's services and call your nearest Naraco plant today.



Method of Racking



Close-up view of Tip and Robber Bar.

NARACO

NATIONAL RACK CO., INC.
179-181 Madison Street
Paterson, New Jersey

IMPERIAL RACK CO., INC.
1109 E. Stewart Ave.
Flint, Michigan

AMERICAN RACK CO.
703 W. Root Street
Chicago, Illinois

INDUSTRIAL RACK CO.
3462 N. San Fernando Rd.
Los Angeles 65, Cal.

GAS APPLIANCE MFRS. ASSN. NAMES NEW MEMBERS

The Gas Appliance Manufacturers Association has announced that the following companies have joined GAMA: All-American Metal Products Co., Philadelphia; Chandler Co., Cedar Rapids, Iowa; Troop Water Heater Co., Pittsburgh; Gibraltar Corp. of America, Inc., Brooklyn; The Welsback Corp., Philadelphia,

and Taymouth Industries Ltd., Toronto.

Delegates and alternates to GAMA include: W. H. Bunten, president, and W. S. Wisniewski, treasurer, All-American; C. W. Chandler, secretary-treasurer, and R. Stodola, engineer, Chandler; H. F. Zempel, assistant manager, Troop; Leo F. Flamm, president, and A. J. Polakoff, vice president, Gibraltar; E. N. Garrett, plant superintendent, and Werner Zimmer-

mann, plant engineer, Welsback; and J. L. Franks, manager, and Leon Zakrzewski, president, Taymouth.

DEEPFREEZE APPOINTS LEONE MANAGER OF OPERATIONS

Pat Leone has been appointed to the new position of manager of oper-



ations of Deepfreeze Appliance Division of Motor Products Corp., North Chicago, Ill., it was announced by F. F. Duggan, vice president and general manager, and reported briefly in March *finish*.

Formerly plants manager, Leone has assumed overall responsibility for production, personnel and purchasing. Under the new setup, the production managers and directors of purchasing and personnel will report to Leone.

Before joining Deepfreeze four years ago, Leone had served as assistant to the general manager of Lustro Corp. Prior to that he was assistant works manager of Rheem Mfg. Co., with whom he was associated for 19 years.

"ICE WATER" TAP IN NEW GIBSON REFRIGERATOR

Gibson Refrigerator Co. recently introduced its 1954 line of refrigerators which have the following features: "a faucet built into the refrigerator cabinet running cold drinking water without refilling; a push-button device to fill ice trays with water right in the refrigerator; and a bacon conditioner."



NEW MONARCH PRECISION DIES *Make for Better and More Economical* STAMPINGS

Our engineers know that efficient, economical production—without sacrificing product quality—is our constant goal on all contract manufacturing. That's why they devote so much care to the detail-perfect designing of precision dies and jigs.

Learn How Contract Manufacturing Can Help You Cut Costs

Before you go to the trouble and expense of expanding your own facilities, check with New Monarch. Many of our customers have found it much more profitable and convenient to use our modern equipment and extremely efficient services. And they know that a contract with us unfailingly means top quality, exact specifications, and prompt, on-schedule delivery.



New Monarch's from-blueprint-to-shipping-carton service includes dies, tools, stampings, assembly, finishing and packing. Send blueprints for estimate.



NEW MONARCH MACHINE & STAMPING COMPANY
406 S. W. NINTH STREET DES MOINES 9, IOWA

HOME LAUNDRY SALES CONTINUE STRONG

Factory sales of standard-size household washers in January totalled 249,956 units, a gain of 30.5% over December, but down 9.9% from January, 1953, according to the American Home Laundry Manufacturers Association.

Dryer sales totalling 82,195 units were down .6% from December, but showed a gain of 32% over January a year ago.

Household ironers totalled 9,792 in January, a gain of 41.7% over the preceding month.

DOMESTIC GAS RANGE SALES RISE

Shipments of domestic gas ranges in January totalled 138,600 units, up 6,200 over December, according to the Gas Appliance Manufacturers Association.

Edward R. Martin, GAMA's director of marketing and statistics, reported that revised estimates of shipments for 1953 total 2,181,300, a gain of 5,900 over the 2,175,400 shipped in 1952.

ELECTRIC FAN SALES SET RECORD IN 1953

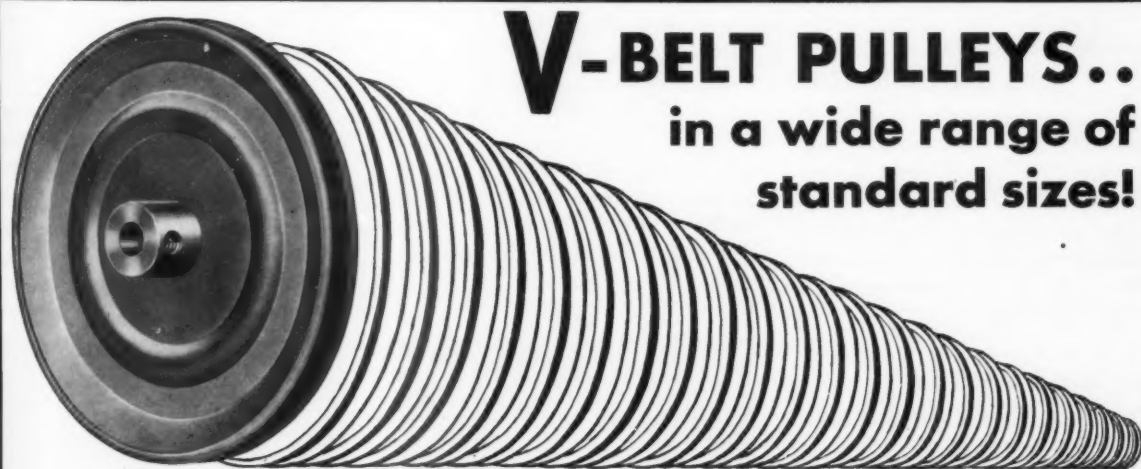
"Electric fan sales reached a record volume last year, doubling the 1952 retail figure. The weather was a factor, but so was more aggressive and intelligent selling," reported Robert A. Orr, of General Electric Co., chairman of the NEMA Electric Fan Section.

**TAILORED for the
APPLIANCE INDUSTRY**

**SPRINGS and
STAMPINGS
STUD CLIPS
SCREW FASTENERS
MOULDING CLIPS
THREADED FORMS
SPECIAL COLD HEADINGS**

In all Metals!

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SUBSIDIARY OF THE BARIUM STEEL CORP.
10234 BEEKA ROAD • CLEVELAND 2, OHIO

NAGEL-CHASE
**CASTERS for YOUR MOBILE
APPLIANCES ARE AVAILABLE
IN SIZES AND STYLES
TO SUIT YOUR NEEDS!**

When you need pulleys for your automatic washers or dryers, consult Nagel-Chase. With a wide range of sizes available, ranging from 2-5/16" O.D. to 14" O.D., the probabilities are that just the size you need is available. Of course, if your quantities required are large enough to warrant it, these specialists in V-Belt pulley manufacture can produce any size you need.

Nagel-Chase pulleys are precision-built of welded pressed-steel with solid steel hub . . . light-weight and designed for long, trouble-free service.

Whatever your requirements in pulleys or casters, consult Nagel-Chase first.

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2811 N. Ashland Avenue, Chicago 13, Ill.
SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!

EKCO ELECTS CRANDALL VICE PRES. OF MANUFACTURING

Purley Crandell has been elected vice president in charge of manufac-



turing, it was announced by B. A. Ragir, president, Ekco Products Co.

Formerly vice president of eastern manufacturing, with headquarters at the firm's Geneva N. Y., plant, Crandell will now headquarter in Chicago, and will have supervision of manufacturing in all 17 Ekco plants.

HARTMAN TO DIRECT SALES FOR COOLERATOR

Following the resignation of H. C. Beresford, The Coolerator Company announced the appointment of Gerald L. Hartman to succeed Beresford as director of sales and advertising. Hartman was formerly associated with Bendix Home Appliance Division of Avco Mfg. Corp.

KAWNEER NAMES FINK MGR. OF PRODUCT DESIGN

Robert R. Fink has been appointed manager of product design for The Kawneer Company, Niles, Mich. Functioning as part of the research and development department, Fink will be responsible for the appearance design of all Kawneer architectural products, stated Lawrence J. Plym, president.

Prior to joining Kawneer, Fink was director of appearance design for The Coolerator Company. From 1947 to 1951, he was associated with

the visual design department of Hotpoint Company, Chicago.

SALOMON HEADS ROYAL METAL

Joseph K. Salomon, general manager and secretary, has been named president of Royal Metal Mfg. Co., Chicago, succeeding Hobart A. Green, who died January 29. Salomon is a son of Joseph Salomon who founded Royal Metal in 1897.

MAJESTIC MFG. ACQUIRED BY UNIVERSAL MATCH

Universal Match Corp. is acquiring Majestic Manufacturing Co., St. Louis, manufacturers of ranges, incinerators and other domestic equipment.

Majestic will continue in operation as a subsidiary, stated A. Fischer, Universal president, who added that some portion of the Majestic plant,

built in 1947 with 130,000 sq. ft. on one floor, is planned to supplement Universal's production operations.

It was indicated that John E. Russell will continue as president of Majestic, and will be proposed as a director of Universal Match.

FULLER JOINS MAYTAG AS FIELD EDUCATION DIRECTOR

Max E. Fuller, formerly dean of the college and professor of speech at Grinnell College, has joined The Maytag Company, Newton, Iowa, as director of field education.

Under a newly-created program, Fuller will direct the setting up of a series of sales training programs implemented in the field organization by sales assistants and regional manager. Fuller's office will provide a sales training program for retail and dealer salesmen.

NORGE SETS UP RESEARCH, PRODUCT DEVELOPMENT DEPT.

Creation of a central research and product development department to develop new home appliances has been announced by the Norge Division of Borg-Warner Corp.

The department, located at Norge's plant in Muskegon Heights, Michigan, will be headed by G. P. Kennedy as director of research, according to S. S. Battles, vice president in charge of manufacturing and engineering. Basic research facilities at Borg-Warner's Bellwood, Ill., laboratories,

will continue to assist Norge engineers.

Formerly Muskegon Heights plant manager, Kennedy will be succeeded by C. P. Martin, manager of manufacturing. K. E. Anderson, formerly assistant to the manager of manufacturing, will be assistant plant manager.

The new department will concentrate on developing home appliances, and will also conduct research and development work on new materials and manufacturing methods for improved appliances.

G. P. KENNEDY



C. P. MARTIN



Do you want to sell MATERIALS to the metal products field?



These leading materials suppliers are reaching the appliance and metal products manufacturing field through finish.

METALS

Armco Steel Corp.
Great Lakes Steel
International Nickel Co.
Jones & Laughlin Steel Corp.
Republic Steel Corp.
Reynolds Metals Company
Rolled Alloys, Inc.
U. S. Steel Company
Youngstown Sheet & Tube Co.

METAL CLEANERS AND METAL PREPARATION MATERIALS

American Chemical Paint Co.
Detrex Corporation
Essak Steel and Chemical Co.
Klem Chemicals, Inc.
Macco Products Company
Northwest Chemical Co.
Pennsylvania Salt Mfg. Co.

METAL FINISHES

The Arco Company
Century Vitreous Enamel Co.
Chicago Vitreous Enamel Product Co.
E. I. du Pont de Nemours & Co.
Ferber-Schorndorfer Co.
Ferro Corporation
The Glidden Company
Grand Rapids Varnish Corp.
The O. Hommel Company
Ingram-Richardson, Inc.
Pemco Corporation
Porcelain Enamel Institute, Inc.
Rinshed-Mason Company

The Sherwin-Williams Co.

OTHER MATERIALS

Acme Steel Company
American Box Board Co.
Arno Adhesive Tapes, Inc.
Atlas Plywood Corp.
Bigelow-Garvey Lumber Co.
The Carborundum Company
Ceramic Color & Chemical Mfg. Co.
Chicago Mill and Lumber Co.
Container Corporation of America
Coors Porcelain Company
Gaylord Container Corp.
General Box Company
International Paper Company
Kieckhefer Box and Lumber Co.
Kimberly-Clark Corporation
McDaniel Refractory Porcelain Co.
Minnesota Mining & Manufacturing Co.
Owens-Corning Fiberglas Corp.
The Patterson Foundry & Machine Co.
Rathborne, Hair & Ridgway Box Co.
Sackner Products, Inc.
Signode Steel Strapping Co.
Titanium Pigment Corp.
The Vitro Manufacturing Co.
Watkins Container Mfrs. Assn.
Weyerhaeuser Sales Co.
Wirebound Box Mfrs. Assn.

FOCUS your selling firepower. finish blankets the multibillion-dollar appliance and fabricated metal products manufacturing field. finish provides the best medium for your company to present your advertising message to the key men in this field . . . the men who specify, purchase and use hundreds of carloads of materials a day for their respective companies.

If you sell: steel — aluminum — copper — brass — plastics — chemicals — drawing compounds — finishes (organic, ceramic or plating) — color oxides — cleaning and pickling materials — insulation — industrial tapes — packing and shipping materials, or any of the scores of materials used by the appliance and metal products manufacturing field, then your sales story should be presented to this excellent market through finish. More and more leading suppliers are depending upon finish to do this important job for them.

The day of umbrella selling is over. Now is the time to focus your advertising and selling on the KEY MEN in the SPECIFIC MARKETS where your materials can be sold profitably in large volume.

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THE MAGAZINE OF
Appliance AND
Metal Products MANUFACTURING

Dana Chase

PUBLICATIONS

FROM RAW METAL TO FINISHED PRODUCT

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NEWS ABOUT SUPPLIERS



Harshaw's new branch office—in Chicago, houses the sales office, warehouse stocks and completely equipped laboratory to service the firm's new nickel plating processes. F. L. Hintze, formerly Cincinnati manager and until recently assistant sales manager at the main office in Cleveland, is in charge. District serves nine states.

PEMCO SETS UP KARL TURK FELLOWSHIP AT HARVARD

The Pemco Foundation, of Baltimore, Md., has established the Karl Turk Fellowship at the Harvard Business School to aid in the education of men "of superior ability in the field of business administration who have had college training, or equivalent experience, in ceramics and allied areas."

The student receiving the fellowship award will be granted \$5000 for

a two-year course of study leading to the degree of Master in Business Administration. Applications must be made before May 1.

\$50 MILLION EXPANSION AT GRANITE CITY STEEL

All major projects have been completed in the expansion program of Granite City Steel Co., Granite City, Ill., according to The Rust Engineering Co., general contractor. Rust contracts totaled \$50,000,000.

Started in 1951, the program has increased the mill's annual ingot production capacity from 700,000 to 1,200,000 ingot tons.

REPUBLIC STEEL UPS SECKLER

Sam A. Seckler has been named an assistant manager of sales for the alloy steel division of Republic Steel Corp., it was announced by Clyde E. Roberts, division sales manager. Seckler has moved his headquarters to Massillon, Ohio, from Chicago, where he was an assistant district sales manager.

BINKS ANNOUNCES SPRAY FINISHING SCHOOL DATES

Binks Manufacturing Co. has announced additional dates for its spray painting schools. The dates for the new schools, conducted at the firm's Chicago plant, are April 5-9, May 3-7, and June 7-11. A feature of the school is a sound-slide film that explains in detail the operation of spray guns and related equipment.

CARBORUNDUM TO ACQUIRE AMERICAN TRIPOLI

Agreement has been reached for The Carborundum Company to acquire the capital stock of American Tripoli Corp., of Seneca, Missouri, it

All-expense trip—to California was award won by E. C. Lassiter (left) for outstanding sales accomplishments on specific accounts of Ferro Corp. Presenting award is W. N. Noble, manager of operations. Looking on is J. R. McCord, manager of ceramic sales. Lassiter is field engineer in southern territory.



On his 70th birthday—W. Joseph Cluff, pres. of Frederic B. Stevens, Inc., was honored by a group of associates. Left to right: John D. Scofield, Udylite; Cluff; Arnold F. Malow, Barton-Malow; and Clyde H. Reeme, Udylite president. Cluff was with Stevens, now a subsidiary of The Udylite Corp., for over 50 years.





F. J. KINSELLA



P. H. VAN PELT



A. R. EDWARDS



JOSEPH BOYCE



R. W. BILL



WALTER KLIE, JR.

was announced by Gen. Clinton F. Robinson, Carborundum president.

"The purchase of American Tripoli, closely related to the abrasive industry, is a further extension of Carborundum's policy of diversification into kindred product lines of the parent firm," said Robinson.

BILL HEADS SHAKEPROOF SALES

Russell W. Bill has been appointed sales manager of the Shakeproof Division of Illinois Tool Works, Elgin, Ill., it was announced by John S. Hawley, Shakeproof marketing manager. Bill started with the division in 1935, and recently was eastern district manager.

VITRO NAMES BOYCE

GENERAL MANAGER

Joseph Boyce has been named general manager of Vitro Manufacturing Co., Pittsburgh, a division of Vitro Corp. of America, according to J. Carlton Ward, Jr., president. With Vitro since 1947, Boyce was recently plant manager.

SHERWIN-WILLIAMS UPS KLIE

Appointment of Walter Klie, Jr., as zone manager, Great Lakes industrial sales, The Sherwin-Williams Co., was announced by Don S. Gaarder, general manager, industrial sales division.

KINSELLA TO SALES POST

AT STANDARD PRESSED STEEL

Francis J. Kinsella has been named manager of outside sales by Standard Pressed Steel Co., Jenkintown, Pa., manufacturers of metal fasteners, precision aircraft specialties and shop equipment.

Formerly midwest regional sales manager, Kinsella moves to a post held by George A. Gade until he was

elected vice president in charge of sales last year.

VAN PELT JOINS HOMMEL

Appointment of Parker H. VanPelt as assistant to the president, The O. Hommel Co., Pittsburgh, was announced by Ernest M. Hommel, president. Formerly associated with U.S. Steel Corp., VanPelt will be concerned with the promotion of sales of porcelain enamel frit to the major appliance manufacturers.

ARMCO INTL. ELECTS

EDWARDS PRESIDENT

A. R. Edwards, vice president in charge of sales, has been elected president of Armco International Corp., Charles R. Hook, chairman of Armco Steel Corp., announced. Edwards succeeds E. A. Emerson, who was elected chairman of the executive committee.

PHEOLL NAMES WILSON

VICE PRES. OF SALES

Cary C. Wilson has been elected vice president in charge of sales of

Pheoll Manufacturing Co., Chicago. Wilson, who joined Pheoll in January, was formerly vice president and general manager of Cinch Mfg. Corp., a subsidiary of United-Carr Fastener Corp.

GENERAL CERAMICS APPT.

Dr. Paul A. Huppert, manager of ceramic coating department, chemical equipment division, General Ceramics & Steatite Corp., Keasbey, N.J., has announced the appointment to his staff of Stanley G. Benner, formerly a ceramic engineer on the research staff of the National Bur. of Standards.

FOOTE ANNOUNCES FURTHER

LITHIUM EXPANSION

Directors of Foote Mineral Co. have tentatively approved further expansion of facilities for the production of lithium ores and chemicals, H. C. Meyer, chairman, announced. The proposed expansion, which will cost several million dollars, will include major additions to plants in Kings Mountain, N.C., and Sunbright, Va.

Detrex's new warehouse—in suburban Los Angeles had doubled size of former facilities. Newly constructed branch serves as headquarters for service and sales engineers serving Pacific region industrial accounts. R. P. Carlisle is Pacific regional manager.



1,240,000 MAN HOURS WITHOUT AN ACCIDENT

The report comes to *finish* that Vitreous Steel Products Co., at Nappanee, Indiana, has operated five consecutive years without a lost time accident. This is calculated to represent 1,240,000 man hours of operation. This would seem to be an excellent record for any plant, but particularly for a shop such as the Vitreous Steel Products Co. where the work includes punch press operations and high temperature processing and finishing.

Touching-up appliance enamels

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rubber goods by the touch-up coating. The effect can be aggravated by exposure to sunlight. Rubber stabilizers usually cause yellowing.

On other occasions the nearness of another industry from which volatile chemicals enter the air may cause difficulty.

Although the alkyd-urea or alkyd-melamine types have predominated, the use of baked vinyls and baked ether resin enamels find increased usage. The latter types furnish greater toughness, and increased acid and alkali resistance. It is rare that any one touch-up lacquer can be used on each of these enamels. A satisfactory product for vinyl and ether type enamels would probably be satisfactory on the conventional urea or melamine alkyd enamel but not vice versa.

Aerosol applicators

Much repair work in the home or by dealers is handled with the aerosol type applicator. The greatest limitation of these units is low solids and slow build up of a film in a touch-up area. The propellant is strictly a diluent in respect to lacquer film formers and therefore puts an upper limit on the solids that a formulator may build into a lacquer used in aerosol units. Much faster film build-up can be achieved from lacquer using touch-up spray guns.

As celebration of this enviable record, the company held an open house for employees, neighbors and friends at Nappanee on Friday evening, February 26.

MARCOWKA TO ARMOUR

RESEARCH

Chester A. Marcowka, formerly with A. O. Smith Corp., has joined the staff of Armour Research Foundation of Illinois Institute of Technology, Chicago, as a ceramic engineer in the ceramics and minerals department.

With the advent of pastel colors and various colors such as used for awnings, a manufacturer or dealer may be pressed to obtain special lots of each color in touch-up quality as fast as needed. Some protective coatings manufacturers have developed a simple process of converting the various color enamels over to lacquer type materials of the same shade. This can be done at the appliance manufacturer's plant very readily by a simple mixing operation. Two precautions must be observed. First, an air dry coating generally dries to a slightly brighter color than a baked film. Second, the performance characteristics of the "hybrid touch-up lacquer" may not equal the performance expected of a specially formulated touch-up lacquer.

Limitations of touch-up coatings

Paint research has upgraded baked enamels to possess considerably better color retention, abrasion resistance, etc., in the past ten years. Many of the present touch-up lacquers, if used with the older baked enamels, would possess superior color retention and show up as light spots after aging. It is essential that each keep pace.

Air dried touch-up coatings are frequently used on porcelain but these organic type materials can not possess the heat resistance and hardness of glass. In spite of these limitations organic coatings remain the primary type available to touch up porcelain or baked enamels. Greater

heat resistance and general performance is constantly being achieved through research.

Patching porcelain...

→ from Page 53

Despite all the precautions taken in both product design and packaging, manufacturers have no control over their products in service. When consumers, by some mishap, damage an appliance, the first place they go is to their dealer, and, of course, they expect that some kind of repair will be made.

As a piece of damaged porcelain enamel cannot be put into factory condition in the field, the next best method of repair must be resorted to. That method must be fairly fast and economical . . . a method which permits the dealer to render a real service to his customer, yet does not tax his personnel, facilities or bank-book to excess.

At Chicago Vit, we have studied a number of methods of repairing porcelain enamel, both under laboratory conditions and in the field. From this experience it is our feeling that the following are particularly important factors in the over-all patching problem.

1. A patched area will not be indiscernible.
2. So far as we can now see, the patch will have to be of an organic nature.
3. The patch should fill the damaged area and provide continuity of surface.
4. There will no doubt be some limitation as to the size or area that can be repaired.
5. The patch should impart as durable a finish as possible.
6. Due to the color difference of household appliances of various manufacturers, no patching compound could be made to match all colors of white. This patching material should be color-matched by the manufacturer for his own products.
7. Since this is a patch or repair, the method application should be simple and economical, and still provide the maximum quality attainable.